

Course Unit	Nutrigenomics		Field of study	Therapy and Rehabilitation	
Bachelor in	Dietetics and Nutrition		School	School of Health	
Academic Year	2021/2022	Year of study	3	Level	1-3
Type	Semestral	Semester	2	ECTS credits	4.0
Workload (hours)			108	Contact hours	
			T	-	TP
			30	PL	15
			TC	-	S
			-	E	-
			OT	5	O
			-	-	-
Code 8149-501-3204-00-21					

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Carina de Fatima Rodrigues

### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. To understand the nutrigenomics as a multidisciplinary bioscience.
2. To know the role of genetic variation in health and disease.
3. To know the organization of human genome and the principal aspects related to gene expression modulation.
4. To know the principal research lines in nutrigenomics and health (chronic diseases).
5. To apply the knowledge about specific target genes modulation to predict the effect of a nutrient.
6. To know the effect of epigenetic phenomenon on nutrigenomics.
7. Understand the possibility to transform knowledge on nutrigenomics in personalized nutrition counselling.
8. To identify the need of ethical guidelines for nutrigenomics research.

### Prerequisites

Not applicable

### Course contents

The new tools that allowed to understand the human genetic variability. Genomic programming and reprogramming. Nutrient and genes interactions at molecular level. Chronic diseases prevention. Research lines and networks in nutrigenomics.

### Course contents (extended version)

1. Introduction to nutrigenomics:
  - Concepts;
  - Impact in human health;
  - Structure and Function of nucleic acids review and human genome organization.
  - Mendelian Genetics: types of gene transmission;
  - Interaction of molecules with genes;
  - Control of gene expression;
  - Genetic variability;
  - How Bioactive food components work;
2. Target genes associated :
  - Acid folic deficiency
  - To Obesity, Type 2 diabetes and Metabolic syndrome;
  - To Osteoporosis;
  - To Inflammation;
  - Molecular mechanisms of longevity regulation and calorie restriction.
  - Vitamin D Deficiency
  - To certain cancers types and cardiovascular diseases;
3. Maternal effect in development (epigenetic effects).
4. Nutrigenomics in practice and Individualized health assessment.
5. Nutrigenomics and Pharmacogenomics.
6. Impact on Public health
7. Ethical issues in nutrigenomics.

### Recommended reading

1. Kaput, J. , Raymond, L. , Rodriguez. M. (2006). Nutritional Genomics: Discovering the Path to Personalized Nutrition. 1st Edition, Wiley
2. Rimbach, G. , e Fuchs, J. (2005). Nutrigenomics: Oxidative Stress and Disease. 1st Edition, Wiley
3. Passarge, E. , Borges- Osório, M. R, Robinson, W. R. , (2004). Genetics: texto e atlas. Porto Alegre. Artmed.

### Teaching and learning methods

The theoretical lessons will use the expository method. The course will include a practical component where students will work on some of the topics addressed, including in the most current and relevant DNA manipulation basic methods. Reading and analysis of current articles on nutrigenomics and different lines of research.

### Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final)
  - Intermediate Written Test - 100% ((75% PT and 25% PL))
2. Alternativa 2 - (Regular, Student Worker) (Supplementary, Special)
  - Final Written Exam - 100% ((75% PT e 25 PL))

### Language of instruction

Portuguese

## Electronic validation

Carina de Fatima Rodrigues	Juliana Almeida de Souza	Josiana Adelaide Vaz	Adília Maria Pires da Silva Fernandes
28-03-2022	05-04-2022	08-04-2022	09-04-2022