# Endocrinology and human nutrition

## Prof. Giacinto Miggiano; Prof. Francesca Cinti

## Module 1: *Endocrinology* (Prof. Francesca Cinti)

***COURSE AIMS AND INTENDED LEARNING OUTCOMES***

The course aims to explore the basic functions of the endocrine metabolic system and, in particular, their impact on motor skills and vice versa.

***Knowledge and understanding (Dublin 1)***

At the end of the course, students will be able to understand the interactions between the endocrine metabolic system and motor skills, and recognise the main endocrine pathologies and their impact on physical activity.

***Ability to apply knowledge and understanding (Dublin 2)***

At the end of the course, students will be able to identify the clinical situations in which physical activity requires the adoption of specific therapeutic measures, and the conditions in which it becomes fundamental in terms of prevention and/or therapeutic help.

***Making independent judgements (Dublin 3)***

At the end of the course, students will be able to propose new and customised physical activity procedures and protocols addressed to specific endocrine pathologies, aimed to prevent the pathologies and the risks related to overtraining and doping.

***Communication skills (Dublin 4)***

At the end of the course, students will be able to communicate information, ideas, problems, and solutions to different kind of audiences.

***Learning skills (Dublin 5)***

At the end of the course, students will be able to develop their knowledge of the topics explained during the course, in order to pursue their studies in this field with a high degree of autonomy.

***COURSE CONTENT***

* General principles of endocrinology and metabolism
Hormone secretion and activity
* Diabetes mellitus (epidemiology, pathogenesis, diagnosis and therapy)
* Role of physical activity in the prevention and treatment of diabetes mellitus
* Indication and management of physical activity in patients with type 1 diabetes
* Management of acute complications of diabetes before/during and after physical activity
* Obesity, adipose organ and metabolic syndrome
* Effect of physical activity on the adipose organ
* The new ormone of physical activity: Irisin
* Thyroid disorders (thyroiditis, hypothyroidism, hyperthyroidism and thyrotoxicosis, thyroid nodules, thyroid tumors)
* Adrenal gland disorders (**(Cushing's syndrome, hypoadrenalism, endocrine hypertension)**
* **Parathyroid and bone disorders (hypoparathyroidism, hyperparathyroidism, osteoporosis)**
* **Hyperandrogenism and hormonal doping.**

***READING LIST***

A. Lenzi-G. Lombardi-E. Martino-F. Trimarchi, *Endocrinologia e attività motorie,* Ed. Elsevier Masson, Milan, 2008.

*B. Diabetes Complications, Comorbidities and Related Disorders.* Cham, Switzerland:Springer nature, doi: 10.1007/978-3-319-27316-7\_18-1

***TEACHING METHOD***

***Knowledge and understanding (Dublin 1)***

Frontal lectures, based on the presentation of the topics listed in the course content, and aimed to help students develop the knowledge and understanding skills mentioned above (through the presentation of interactive clinical case scenarios and slides).

***Ability to apply knowledge and understanding (Dublin 2)***

The presentation of a wide selection of practical examples will give students the opportunity to apply their newly acquired knowledge and understanding skills in specific and concrete situations

***Making independent judgements (Dublin 3)***

During the lectures, students will receive further information on the protocols mentioned in the course aims, and they will be invited to carry out a personal in-depth analysis of the topics explained in class

***Communication skills (Dublin 4)***

Thanks to this teaching method, students will be able to acquire an appropriate terminology through the discussion of specific case studies.

***Learning skills (Dublin 5):***

The critical and ‘problem-oriented’ approach towards the different topics explained in class will help students develop their independent judgment and learning skills, which are fundamental to pursue their studies in this field.

***ASSESSMENT METHOD AND CRITERIA***

Multiple-choice quiz and/or oral exam on the course content. The final mark, expressed in thirtieths, will result from the average between the two modules. In order to pass the final exam, students will have to follow the official procedure.

***NOTES AND PREREQUISITES***

Students should have a good knowledge of the key concepts of biochemistry and the anatomy and physiology of the endocrine system

Further information can be found on the lecturer's webpage at http://docenti.unicatt.it/web/searchByName.do?language=ENG or on the Faculty notice board.

## Module 2: *Human nutrition* (Prof. Giacinto Miggiano)

***COURSE AIMS AND INTENDED LEARNING OUTCOMES***

The course aims to explore the key concepts of nutrition, and the different forms of dietary-nutritional intervention addressed to normal subjects and people who practice sports.

***Knowledge and understanding (Dublin 1)***

At the end of the course, students will be able to understand the ways in which the human body uses nutrients and other bioactive compounds, with a focus on metabolism, growth, the development and functions of the organism, and individual well-being.

***Ability to apply knowledge and understanding (Dublin 2)***

At the end of the course, students will be able to adopt strategies aimed to improve the quality of life and promote health; in addition, they will be able to manage the most common nutritional issues and requests related to physical activity.

***Making independent judgements (Dublin 3)***

At the end of the course, students will be able to make independent judgments on the different dietary-nutritional intervention strategies addressed to normal subjects and/or people in specific conditions (before, during, and after physical activity).

***Communication skills (Dublin 4)***

At the end of the course, students will be able to communicate information, ideas, problems, and solutions to different kind of audiences

***Learning skills (Dublin 5)***

At the end of the course, students will be able to develop their knowledge of the topics explained during the course, in order to pursue their studies in this field with a high degree of autonomy

***COURSE CONENT***

*Basic and Applied Human Nutrition*

1.1.1 Nutrients: at the basis of life.

1.1.2 The meaning of feeding, nutrition, and dietetics.

1.2.1 The concept of balance.

1.2.2 The introduction, deposit, and excretion of nutrients.

1.3.1 The sources of food. Food groups and composition.

1.4.1 Nutrients and energy balance. Carbohydrates, fats, and proteins.

1.4.2 An introduction to protein, carbohydrate, and fat metabolism. The metabolic adaptation to fasting.

1.4.3 Ethanol: from metabolite to toxic element.

1.5.1 Hydrosaline metabolism (sodium, potassium, and chlorine).

1.5.2 Macrominerals (calcium, phosphorus, magnesium, and sulphur). Functions and metabolism.

1.5.3 Microminerals (iron, copper, zinc, and iodine). Oligominerals (selenium). Functions and metabolism.

1.6.1 Water-soluble vitamins (the vitamin B-complex: B1, B2, B3, B5, B8, B9 or folic acid, B12, and vitamin C).

1.6.2 Fat-soluble vitamins (vitamin A, D, E, and K). Structure, functions, and metabolism.

1.6.3 Vitamin F (essential fatty acids: linoleic acid, and arachidonic acid). Eicosanoids.

 *Healthy Nutrition*

2.1.1 Nutrients and health.

2.1.2 Nutraceutics: useful molecules for life.

2.1.3 Pharma food or functional food: useful for health promotion.

2.2.1 Food safety and security.

2.3.1 Epidemiology of nutrition diseases in Italy and in the rest of the world.

2.4.1 Calorie and protein-calorie malnutrition. Obesity. The world of weight loss diets.

 *Sport Nutrition*

1.1.1 Nutrients: at the basis of physical activity.

1.2.1 Energy for physical activity. Measuring energy metabolism. Physical activity energy expenditure.

1.3.1 Body composition (definition; explanation of the different ways to determine it).

1.3.2 Body composition and health: between a correct nutrition and a regular physical activity.

1.4.1 Nutritional strategies for sport (before-during-after the performance/training).

1.4.2 Nutritional strategies to reach the right body composition.

1.4.3 Dietary-nutritional strategies in particular conditions (e.g. hormonal imbalance, menopause, and vegetarianism).

***READING LIST***

Giacinto AD. Miggiano, L’alimentazione per lo sportivo, Il Pensiero Scientifico Editore, Rome, 2020

Giacinto AD. Miggiano, La Nutrizione nelle Malattie del Metabolismo, Il Pensiero Scientifico Editore, Rome, 2017.

G. Miggiano, Nutrizione umana - Quiz di autovalutazione, Società Editrice Universo, Rome, 2016.

G. Miggiano, Nutrizione umana - Quiz di autovalutazione, Società Editrice Universo, Rome, 2002.

***TEACHING METHOD***

***Knowledge and understanding (Dublin 1)***

Frontal lectures, based on the presentation of the topics listed in the course content, and aimed to help students develop the knowledge and understanding skills mentioned above (through the presentation of interactive clinical case scenarios and slides).

***Ability to apply knowledge and understanding (Dublin 2)***

The presentation of a wide selection of practical examples will give students the opportunity to apply their newly acquired knowledge and understanding skills in specific and concrete situations

***Making independent judgements (Dublin 3)***

During the lectures, students will receive further information on the protocols mentioned in the course aims, and they will be invited to carry out a personal in-depth analysis of the topics explained in class

***Communication skills (Dublin 4)***

Thanks to this teaching method, students will be able to acquire an appropriate terminology through the discussion of specific case studies.

***Learning skills (Dublin 5):***

The critical and ‘problem-oriented’ approach towards the different topics explained in class will help students develop their independent judgment and learning skills, which are fundamental to pursue their studies in this field.

***ASSESSMENT METHOD AND CRITERIA***

Multiple-choice quiz, based on the course content, that may be replaced or followed by additional written/oral tests, if necessary. In order to pass the final exam, students will have to follow the official procedure.

***NOTES AND PREREQUISITES***

Further information can be found on the lecturer's webpage at http://docenti.unicatt.it/web/searchByName.do?language=ENG or on the Faculty notice board.