UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# COURSE SYLLABUS

# Nutrition: From Traditional Foods To Novel Foods

**2425-2-F0901D058**

## Aims

The objectives of the course are:
a) to introduce the fundamental principles of human nutrition and dietetics;
b) illustrate the hormonal principles of energy metabolism control;
c) illustrate the most recent innovations in the food sector (novel food) and new cultivation techniques to increase environmental sustainability;
d) Finally, notes on diet therapy in different clinical conditions and the use of biotechnologies

## Contents

Macronutrients
Micronutrients vitamins and minerals
Animal and vegetable foods, water and salt
Alcohol, Fermented Drinks and Coffee
Phytocompounds and Nutraceuticals
Metabolism control: Insulin and Glucagon
Gene control of metabolism (AKT AMPK PPAR SCREBP CREBP ect)
Body weight control (hunger, satiety, fasting)
Mediterranean diet, vegetarian, ketogenic diet and others
Nutrition and sport
Functional foods, EFSA
Novel food Insects, Algae, Jellyfish and cultured meat
New food: planted-base
Waste or resources? Circular economy and sustainability
Food of the future, what we will eat in space
Diet therapy in various clinical conditions, and possible interactions with biotechnology

## Detailed program

The course has, in particular, the purpose of:

1. to acquire fundamental knowledge on the nutritional functions of carbohydrates, proteins, lipids, vitamins, and mineral salts and their population and individual needs;
2. provide the notions for calculating the energy needs of the population according to age, sex, and physical activity;
3. provide the basic notions on the product and nutritional characteristics of food groups;
4. provide the basic notions on the characteristics of particular foods (fermented drinks, coffee), the main nutraceuticals, functional and enriched foods, and the European standards that regulate them (EFSA);
5. make known basic nutrition and the primary methods for assessing body composition, energy expenditure, and nutritional status and the guidelines for proper nutrition;
6. provide the basics of nutritional biochemistry to understand the mechanisms of digestion, absorption, and metabolism of food and nutrients and the regulation of hunger and satiety, and the control of body weight;
7. provide the principal notions of biochemistry on the control of energy and hormonal metabolism (insulin-glucagon) and cellular pathways;
8. provide adequate knowledge on the planning of nutritionally adequate diets, especially in physiological conditions, and on the role of macro and micronutrients on general health, with the use of LARN, of the Guidelines for a Healthy Diet;
9. provide knowledge on nutrition and physical activity;
10. provide adequate knowledge on the circular economy, sustainability, and new cultivation techniques;
11. provide knowledge on Novel Food (insects, algae, jellyfish, etc.) and the food of the future (meat without animals);
12. Diet therapy in various clinical conditions and possible interactions with biotechnologies.
    a.Overweight and obesity will be framed, also as causative factors of other comorbidities, such as hypertension, dyslipidemia, diabetes, and hyperuricemia. The first 4 hours of surgery will focus on these 5 pathologies.
    b. Diet and oncological diseases, in preventive and therapeutic terms, diet and neurological, osteoarticular and rheumatological diseases, food allergies, and other hypersensitivities to specific nutrients.
    c. The Microbiota as an essential modulator for the response to specific nutritional interventions: the last 2 hours will be dedicated to the description of the current know-how on the microbiota and the reasons why it will become the target of many dietary interventions.

## Prerequisites

## Teaching form

DE- Lessons of 2 hours carried out in presence mode

## Textbook and teaching resource

1. La Basi molecolari della nutrizione- Giuseppe Arienti V ed. Piccin
2. Biochimica della nutrizione - Carla Pignatti Esculapio
3. Scienza dell'Alimentazione Anna Maria Giudetti , Raffaelle Cagnazzo, Francesco Cagnazzo Edi.Ermes

## Semester

I semester

## Assessment method

INTERVIEW ON TOPICS DEVELOPED IN LESSON AND AN IN-DEPTH INSIGHT OF THE STUDENT'S CHOICE

The student will have to choose a topic covered in class, study it in depth thanks to a good and recent bibliography, and prepare an oral presentation of approximately 15-20 minutes.
The presentation must have an introduction, followed by an in-depth analysis with recent results and a bibliography. The student will have to discuss it by adding his reflection.
Finally, the commission will ask 1-2 questions about the presentation and topics covered in class.

## Office hours

Reception by appointment
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## Sustainable Development Goals

ZERO HUNGER | GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION