

BIO-441

Nutrition: from molecules to health

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Cursus	Sem.	Type
Biotechnology minor	E	Opt.
Life Sciences Engineering	MA2, MA4	Opt.
Sciences du vivant	MA2, MA4	Opt.

Language of teaching	English
Credits	4
Session	Summer
Semester	Spring
Exam	During the semester
Workload	120h
Weeks	14
Hours	4 weekly
Courses	2 weekly
Exercises	2 weekly
Number of positions	

Remark

Integrated and holistic systems approach from molecules to health - For MSc students only

Summary

The course will address how nutrition affects human health and disease. We will describe how nutrients are absorbed and metabolized. We will introduce the concept of the integrated systems approach to better define human health based on holistic phenotyping of human individuals

Content

- Fundamentals of nutrition and its impact on human health and non-communicable disease
- Introduction of the gastrointestinal system and the hormonal regulation of digestion and absorption.
- Effect of glucose and fructose on tissue function and human health
- Polyphenols and their impact on health and disease
- Introduction and current utility/challenges of omics technologies for nutritional and health sciences, with emphasis on the characteristics of the technologies (genomics, proteomics, metabolomics, micronutrient analysis)
- Translations and applications of molecular phenotyping in the areas of metabolic and gastrointestinal health.
- Concept and utility of molecular phenotyping to clinical intervention studies
- Methods and concepts of human genetics and their applications to nutrigenetics
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Learning Outcomes

By the end of the course, the student must be able to:

- Define the basics of nutrition and its impact on human health
- Manage principles of macronutrient absorption and metabolism
- Demonstrate knowledge about current omics technologies
- Develop a molecular understanding of the role of nutrition in health

Teaching methods

Lectures

Expected student activities

Reading, analysis, presentation of a scientific article in the field of nutrition and preparation of a mini grant proposal.

Assessment methods

Weakly evaluation with a quiz (questions related to the course), presentation of one scientific article (from a proposed list), writing of mini grant