

## COURSE

### Metabolomics approach in food and agricultural sciences

SSD: CHIM/06

PHD COURSE: Food Science

ACADEMIC YEAR: 2025/2026

## COURSE DESCRIPTION

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## GENERAL INFORMATION

**SUGGESTED YEAR:** I, II

**PERIOD:** from June to July

**CFU:** 4

### EXPECTED OUTCOMES

By the end of this course, PhD students will be able to:

- Understand the fundamental principles of the "omics" sciences, with a specific focus on targeted and untargeted metabolomics.
- Evaluate and select the appropriate analytical technique for conducting metabolomics analyses on various matrices.
- Effectively plan experimental designs and analyze metabolomics data.
- Present metabolomics results clearly and concisely.

### CONTENTS/SYLLABUS

1. Introduction to the course: an overview of the "omics" sciences (genomics, transcriptomics, proteomics, lipidomics, metabolomics, fluxomics).
2. Metabolomics workflow (experimental design, sample harvesting and storage, extraction techniques, purification methods for targeted metabolomics).
3. NMR-based metabolomics approach (sample preparation, data acquisition, data processing, identification, and quantification) and its application in agri-food systems.
4. MS-based metabolomics approach (sample preparation, data acquisition, data processing, identification, and quantification) and its application in agri-food systems.
5. Data analysis, data interpretation, software, and databases.

## READINGS/BIBLIOGRAFY

## TEACHING METHODS

Lectures	hours: 13
Laboratory	hours: -
Seminars	hours: 6
Other activities	hours: 5 + 3

(tutorials + discussion with international experts)

## EVALUATION CRITERIA

### a) Methods for acquiring eligibility

- Written exam
- Oral exam
- Project discussion
- Other

### b) Evaluation pattern

For the eligibility, a percentage of the attendance at the course of at least 75% is requested.