

# Applied physics [ SG423 ]

Academic Activity a.y. 2027/2028

**Lecturer(s):**

**Time period:** Primo Ciclo Semestrale

## Learning objectives:

The course 'Applied Physics and Electronics systems (Mod 1 - Applied Physics)' will prepare students with a solid background on physical principles and models useful for better understanding the modern technologies employed in food processing, preservation, and environmental monitoring. By integrating the core concepts of physics with practical applications in sensors, the course provides the essential scientific foundation required to analyze, model, and optimize technological processes relevant and essential to the food industry. The course approach aims to combine lectures, and theoretical sessions including problem-solving exercises, and computational simulations interpretation. This integrated methodology encourages students to apply conceptual knowledge to concrete technological scenarios, enhancing their analytical and problem-solving skills while fostering a deeper understanding of the physical basis of modern food and environmental technologies.

After finishing the course, students will possess the basic and analytical skills necessary to analyze, design, and optimize physics-based systems employed in ensuring food safety, quality, and extended shelf life. They will develop a comprehensive understanding of how physical principles and technological innovations can be applied to monitor, control, and improve processes within the food industry.

This competence will be particularly crucial in the context of future global challenges, where extreme climate change conditions are expected to increasingly affect food production, processing, and preservation systems. In such scenarios, students will be able to make informed decisions in selecting appropriate sensors and technologies, evaluating their suitability for specific applications and environmental conditions.

Furthermore, the students will be equipped to know how to collaborate effectively with engineers and multidisciplinary teams, clearly articulating the physical and technological parameters involved in system design and operation. They will also acquire the ability to interpret and analyze data generated by commercial or custom-built sensors, transforming raw measurements into meaningful insights that can support decision-making, process optimization, and innovation in food and environmental monitoring technologies.

The competencies developed in this course directly support the professional profiles described in the program's learning objectives, particularly those related to Food Tech for Ecological Transition.

## Prerequisites:

It is recommended that students attending this course should already have an elementary background in:

Classical physics, basic mathematics, general chemistry and materials science;

Basic knowledge of data analysis and graphical representation of experimental results;

A strong interest in the application of physical sciences to food systems monitoring technology and willingness to engage in multidisciplinary problem-solving.

## Course contents:

Program

The course will explore the following four main areas, aiming to combine theoretical foundations with practical applications relevant to food technology, preservation, and environmental monitoring:

Fundamental laws of physics governing matter, energy, and their interactions:

This section introduces the essential physical principles that describe the behaviour of matter and energy in various states and conditions. Emphasis will be placed on understanding how these fundamental laws form the basis for technological processes in developing technology for the food industry.

Theoretical and mathematical models to describe and interpret real-world physical systems:

Students will learn how to apply theoretical and mathematical models to describe physical phenomena relevant to industrial processes. The focus will be on translating real-world problems into mathematical form, analysing system behaviour through equations and simulations, and interpreting model outcomes in practical contexts.

Physical measurements, experimental data acquisition and analysis:

This section covers the methodologies and techniques used in experimental physics to measure physical quantities accurately and reliably. Students will become familiar with the design of experiments, calibration procedures, uncertainty estimation, and error propagation. Practical sessions will introduce data acquisition systems, digital signal processing, and the use of computational tools for data visualization and interpretation, preparing students to

handle and interpret the real experimental and industrial data.

Principles, design, and operation of sensors and measurement systems used in food technology and environmental monitoring:

The final section focuses on the technological aspects of sensors and measurement systems used to monitor and control key parameters in food safety and environmental applications. Topics include sensor classification (temperature, humidity, pressure, chemical composition, optical and biosensors) and system integration. Students will analyze both commercial and custom-designed sensors, learning how to select, implement, and interpret sensor data to ensure quality control, safety, and sustainability in food technology processes.

Teaching method

Teaching language: English

The teaching method is primarily designed to bridge theoretical knowledge with practical application.

The course will combine lectures devoted to the explanation of basic physical and technological principles with interactive theoretical lessons that promote critical discussion. In addition, students will engage in problem-solving exercises aimed at developing analytical reasoning and quantitative modelling skills relevant to real-world technological systems application. Interpretation of computational simulations will complement these activities, allowing students to visualize complex physical phenomena and explore the behaviour of systems under different operating conditions.

Furthermore, possible group projects and collaborative assignments will be organized to promote teamwork, communication, and the ability to integrate multidisciplinary perspectives when addressing problems related to food technology and environmental monitoring.

This blended methodology will actively be learning and continuous engagement, enabling students to apply theoretical frameworks to concrete technological and industrial contexts. Through this process, student enhance their ability to analyze, interpret, and design physics-based solutions for food and environmental applications, while deepening their understanding of the scientific foundations underlying modern processing and monitoring technologies.

Criteria, rules and procedures for the exam

For full-time students

The exam is aimed at ascertaining knowledge of the topics listed in the official program of the course and the ability to apply the theoretical contents for the solution of simple case studies.

The exam involves written proof lasting ..... minutes including both multiple-answer questions and open questions (and possible short exercises, for extra points). No books, notes or any other didactic material is allowed.

Exam procedures are partially differentiated according to whether students have had more or less than 30% absences (in compliance with the University regulations). In particular, for students who have exceeded this threshold an additional teaching load is envisaged, consisting of..... and agreed in advance with the lecturer. For students who have not exceeded the 30% absences threshold, the final grade may be supplemented by the marks obtained in interim assessment tests (in accordance with the rules approved by the Academic Council).

The assessment criteria will be as follows: accuracy and knowledge of the topics; precision and completeness of answers; critical thinking and logical structure of exposition; autonomy in developing responses; ability to use appropriate technical language.

100% of the grade relating to the written exam.

For part-time students

The exam is aimed at ascertaining knowledge of the topics listed in the official program of the course and the ability to apply the theoretical contents for the solution of simple case studies.

The exam involves written proof including both multiple-answer questions and open questions (and possible short exercises, for extra points). No books, notes or any other didactic material is allowed.

100% of the grade is contributed by the written exam.

The assessment criteria will be: in-depth and accuracy of knowledge of the topics; precision and completeness of answers; critical thinking and logical structure of exposition; autonomy in developing responses; ability to use appropriate technical language.

### **Recommended readings:**

For full-time students

Special teaching material has been developed for this course, which does not completely coincide with texts available on the market.

The recommended text for all including lecture slides, will be provided by the professor in PDF format.

Supplementary readings and reference textbooks, while not mandatory, will be recommended to support and deepen the understanding of specific topics.

The text will be supplemented by readings that will be made available to students before the respective lectures via the University's e-learning platform.

Exercises: before each lecture, the lecturer will indicate to the students the material to be studied, in order to carry out in-class exercises and/or discussions related to it.

Possible supplementary bibliography:

In addition, a selection of relevant scientific papers will be uploaded to the student portal to complement the theoretical and practical aspects discussed during the lectures.

For part-time students

Special teaching material has been developed for this course, which does not completely coincide with texts available on the market.

The recommended text for all including lecture slides, will be provided by the professor in PDF format.

Supplementary readings and reference textbooks, while not mandatory, will be recommended to support and deepen the understanding of specific topics.

The text will be supplemented by readings that will be made available to students before the respective lectures via the University's e-learning platform.

Exercises: before each lecture, the lecturer will indicate to the students the material to be studied, in order to carry out in-class exercises and/or discussions related to it.

Possible supplementary bibliography:

In addition, a selection of relevant scientific papers will be uploaded to the student portal to complement the theoretical and practical aspects discussed during the lectures.

### **The academic activity is offered in:**

#### **Scienze Gastronomiche**

<b>Program type:</b>	<b>Program: (Curriculum: )</b>	<b>Curriculum:</b>	<b>Credits:</b>	<b>Sector:</b>
Bachelor or equivalent first cycle	Food Tech for Ecological Transition (2026)comune		6	PHYS-04/A

*Printed on: 19/02/2026*

## Applied physics and electronics systems [ SG422 ]

Academic Activity a.y. 2027/2028

*Lecturer(s):*

*Time period:* Ciclo Annuale Unico

**Syllabus not published by lecturer.**

**The academic activity is offered in:**

**Scienze Gastronomiche**

<b>Program type:</b>	<b>Program: (Curriculum: )</b>	<b>Curriculum:</b>	<b>Credits:</b>	<b>Sector:</b>
Bachelor or equivalent first cycle	Food Tech for Ecological Transition (2026)comune		0	PHYS-04/A, IINF-01/A

*Printed on: 19/02/2026*

# Cultural sustainability and technological change [ SG427 ]

Academic Activity a.y. 2027/2028

**Lecturer(s):**

**Time period:** Secondo Ciclo Semestrale

## Learning objectives:

The course “Cultural sustainability and technological change” provides students with conceptual and methodological tools to understand how technological innovation interacts with cultural systems, values, and social practices in food production and consumption. It aims to foster critical awareness of cultural sustainability as a key dimension of ecological transition, exploring the social meanings of technologies and their role in shaping identities, traditions, and local knowledge.

At the end of the course, students will be able to:

- Recognize the cultural implications of technological change in the food sector;
- Analyze case studies where innovation processes engage or challenge local traditions and food heritage;
- Contribute to interdisciplinary projects that integrate technological, ecological, and cultural perspectives in sustainable food design;
- Communicate cultural analysis effectively within professional contexts related to food innovation and policy

## Prerequisites:

No prerequisites are required.

## Course contents:

**Program**

Introduction to cultural sustainability: concepts, definitions, and frameworks;

Anthropology of technology: tools, practices, and meanings;

Cultural perspectives on innovation in food systems;

Local knowledge and traditional ecological practices;

Technology and identity: narratives of progress and resistance;

Case studies: sustainable innovation and food heritage;

Group discussion: designing culturally sustainable innovation pathways.

Note: The programme is to be considered as a forecast and may be subject to minor changes according to specific class needs.

**Teaching method**

The course combines lectures, seminar discussions, group activities, and analysis of case studies. Active participation is encouraged through collaborative learning and brief project work.

Teaching language: English

**Criteria, rules and procedures for the exam**

For full-time students

The exam consists of an oral test in English lasting approximately 15–20 minutes, including questions on the topics covered during the course. The exam aims to assess the knowledge acquired and the student's ability to apply it to specific cases. No notes or books may be used during the exam.

Examination procedures may vary depending on student attendance (in compliance with university regulations). For students exceeding 30% of absences, an additional task is required, consisting of reading selected scientific readings (available on Moodle) agreed upon with the lecturer.

Evaluation criteria will be: in-depth and accuracy of knowledge of the topics; precision and completeness of answers; critical thinking and logical structure of exposition; autonomy in developing responses.

For part-time students

The exam consists of an oral test in English on the topics covered in the programme and will be graded out of 30.

The same evaluation criteria as for full-time students apply, with the oral exam representing 100% of the final grade.

## Recommended readings:

For full-time students

A dedicated set of teaching materials will be developed for this course, which does not fully coincide with published textbooks. Materials will be made available to students before each lecture via the designated online platform and

organised by topic.

For efficient consultation, students are encouraged to refer to the course syllabus available on the same platform.

For part-time students

A dedicated set of teaching materials will be developed for this course, which does not fully coincide with published textbooks. Materials will be made available to students before each lecture via the designated online platform and organised by topic.

For efficient consultation, students are encouraged to refer to the course syllabus available on the same platform.

### **Further readings:**

**Learning objective**

The professional profile of graduates in "Food Tech for Ecological Transition", capable of understanding the cultural dimensions of sustainability and innovation in food systems, is typically entrusted with the task of mediating between technological development and socio-cultural contexts, promoting inclusive and responsible innovation, and contributing to the design of innovative strategies for sustainability.

**Response to the learning objective**

With the aim of demonstrating the effective preparation for the threshold competencies the student will be asked to demonstrate, before the end of this course module, that they have attained knowledge about the following points of particular importance:

- Knowledge of the theories of cultural sustainability and their application to food systems.

and capacity to apply knowledge:

and the ability to apply such knowledge:

- Ability to critically analyse technological change in relation to cultural values;
- Competence in integrating the anthropological perspective into innovation processes.

### **The academic activity is offered in:**

#### **Scienze Gastronomiche**

<b>Program type:</b>	<b>Program: (Curriculum: )</b>	<b>Curriculum:</b>	<b>Credits:</b>	<b>Sector:</b>
Bachelor or equivalent first cycle	Food Tech for Ecological Transition (2026)comune		6	SDEA-01/A

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# Electronics systems for food [ SG424 ]

Academic Activity a.y. 2027/2028

**Lecturer(s):**

**Time period:** Secondo Ciclo Semestrale

## Learning objectives:

The course 'Applied Physics and electronics systems - (Mod 2 - Electronics systems for Food)' will prepare students for understanding the basics of electronic systems, with a specific focus on the ones applied to the food chain of value.

After finishing the course, students will be able to understand the architecture of an electronic system and its usefulness in the food chain of value, with basic capacities in choosing the right solution for a specific application.

## Prerequisites:

No specific background requirements.

## Course contents:

**Program**

Introduction to electronic systems and their components:

- decomposition in functional blocks
- signals in time/frequency domain
- difference between analog and digital signals
- analog vs digital electronics

Digital systems:

- combinational and sequential circuits
- interfacing
- dynamical properties.

Basic digital blocks, registers and counters.

Analog to digital and digital to analog conversion.

Microcontrollers: peripherals description and application of programming languages.

Output signals, sensors and actuators.

Structure of general electronic devices: PC and mobile phone.

Example of electronic systems for the food chain of value.

**Teaching method**

Teaching language: English.

The teaching method consists in theoretical lectures with some exercises and laboratories where the students can apply the concepts learnt during the theoretical part.

**Criteria, rules and procedures for the exam**

For full-time students

The exam consists of a written test (which may be taken in Italian or English at the student's choice) by open-ended questions lasting 120 minutes (without the aid of notes or books) aimed at ascertaining the acquisition of knowledge about Electronic Systems for Food. An oral exam can be done under a specific request of the student or of the professor, for detailing better some exam aspects.

Exam procedures are partially differentiated according to whether students have had more or less than 30% absences (in compliance with the University regulations). In particular, for students who have exceeded this threshold an additional teaching load is envisaged, consisting of an additional question and agreed in advance with the lecturer. For students who have not exceeded the 30% absences threshold, the final grade may be supplemented by the marks obtained in interim assessment tests (in accordance with the rules approved by the Academic Council).

The assessment criteria will be as follows: 100% relating to the written exam taken, with in case an update if not mandatory oral exam is taken.

For part-time students

Same as full-time students.

## Recommended readings:

For full-time students

Special teaching material has been developed for this course, which does not completely coincide with texts available on the market. Slides will be given available for the students.

For part-time students

Special teaching material has been developed for this course, which does not completely coincide with texts available on the market. Slides will be given available for the students.

### **Further readings:**

**Learning objective**

The professional figure of the “graduate in Food Tech for Ecological Transition“ who works in the context of Electronic Systems for Food is typically entrusted with the task of:

- Learning the basics of electronic systems
- Learning the possible architectures
- Learning the application of electronic systems to the food chain of value

At the threshold level, this figure must be able to conceive which is the electronic system most useful for the specific food application.

This course module proposes providing at the basic level:

- Competences aimed at design at high level electronic systems for food technologies
- Competences in conceiving possible solutions for generate and manage data for food applications

**Response to the learning objective**

With the aim of demonstrating the effective preparation for the threshold competencies the student will be asked to demonstrate, before the end of this course module, that they have attained knowledge about the following points of particular importance:

- Understand the architecture of an electronic system
- To be able to structure at high level the design of an electronic system

and capacity to apply knowledge:

- Conceiving an electronic system for a specific and novel application scenario
- Prepare a document for giving the necessary specification for an electronic system for food applications

### **The academic activity is offered in:**

#### **Scienze Gastronomiche**

<b>Program type:</b>	<b>Program: (Curriculum: )</b>	<b>Curriculum:</b>	<b>Credits:</b>	<b>Sector:</b>
Bachelor or equivalent first cycle	Food Tech for Ecological Transition (2026)comune		6	IINF-01/A

*Printed on: 19/02/2026*

## Field visits - 2nd year [ SG428 ]

Academic Activity a.y. 2027/2028

**Lecturer(s):**

**Time period:** Ciclo Annuale Unico

### Learning objectives:

The learning activity "Field visits" offers preparation for professional contexts requiring the ability to observe, analyse, and critically interpret food systems and production processes within real operational environments, with a particular focus on environmental, economic and social sustainability, as well as technological innovation.

The learning activity "Field visits" is present every academic year and it is characterized by a strong experiential part envisaging two didactic visits per year, each predominantly linked to one or more specific learning goals. In the second year, in particular the aims are to:

- analyse and map the different stages of a food processing operation, including the fundamental unit operations, raw materials, intermediate products, by-products, and processing waste;
- understand and describe different approaches to product innovation in the food industry;
- map the direct and indirect actors involved in agri-food systems;
- analyse and manage the valorization of by-products with a view to the circular economy;
- propose operational strategies for implementing sustainability practices in the processes observed.

The course will prepare students to:

- understand food systems and production processes through direct experiential learning;
- analyse technological, environmental, and organisational aspects of agri-food realities;
- connect theoretical knowledge acquired in core courses with real-world case studies;
- critically reflect on sustainability challenges and innovation strategies in food systems;
- interact with professionals operating in different areas of the agri-food sector.

### Prerequisites:

No specific prerequisites are required.

### Course contents:

**Program**

Two didactic visits (field visits) are envisaged within this course, each characterized by specific learning goals. In particular, on the second year:

- the first field visit will be focused on understanding industrial food processing and how new/innovative products are developed within food industry;
- the second field visit will be focused on the overall process analysis and on the by-products identification, management and their valorization.

Each field visit will be structured into three phases:

Phase 1: Preparation (lectures and group work) 2h in the classroom

Phase 2: Experiential learning on site (company visits / field activity) 8h in the company

Phase 3: Reflection and synthesis (collective reflections) 2h in the classroom

The teaching language for all three phases is English.

Note: The programme is to be considered as a forecast and may be subject to minor changes according to specific class needs.

**Teaching method**

Teaching activities include class discussions, visits to company and different production realities operating in the food sector and group work. Based on the class numerosness, students can be divided into different groups within each field visit.

Teaching language: English

**Criteria, rules and procedures for the exam**

For full-time students

The exam consists of a group presentation to the class, or a 15-minute video, or a collection of 20 photographs with narrative, or a 15-minute podcast, freely chosen by students, focusing on one field trip or on a meta-theme emerging across multiple field trips.

Assessment criteria will be:

Phase 2: students are assessed based on behaviour, attention, and level of participation.

Phases 1 and 3: proactive participation during in-class activities, accuracy of the self-produced contents,

completeness of the work, research skills, ability to analyse, elaborate, and critically reflect.

The weighting of assessments toward the final grade: 100% of the self-produced material and the behavior maintained throughout the entire field visit.

Examination procedures are partially differentiated depending on whether students have exceeded or not 30% of absences (in compliance with university regulations).

In particular, students exceeding this threshold are required to complete an additional academic workload, given by teachers.

For part-time students

The exam will consist of an oral interview in English on the topics covered during the field visit programme. It will be graded on a scale of 30. Part-time students will take an oral exam, and this will contribute 100% to their final grade according to the same criteria outlined for full-time students.

### **Recommended readings:**

For full-time students

A dedicated set of teaching materials will be developed for this course, which does not fully coincide with published textbooks. Materials will be made available to students after each lecture via the designated online platform and organised by topic.

For part-time students

A dedicated set of teaching materials will be developed for this course, which does not fully coincide with published textbooks. Materials will be made available to students after each lecture via the designated online platform and organised by topic.

### **Further readings:**

**Learning objective**

Graduates in 'Food Tech for Ecological Transition' are required to be able to analyse and optimise food systems and processes in terms of sustainable development. Within this framework, the activity "Field Visits" aims to develop threshold competencies enabling students to:

- understand food production systems through direct observation;
- identifying critical issues relating to technology and environmental, social and economic sustainability in real-world contexts;
- recognise opportunities for sustainable innovation in products and processes.

At a basic level, the course provides:

- skills supporting systemic process analysis;
- competencies related to sustainability assessment and innovation;
- capabilities that support the development of stakeholder maps;
- the ability to connect technical, ecological, and socio-organisational dimensions of food systems.

**Response to the learning objective**

With the aim of demonstrating the effective preparation for the threshold competencies the student will be asked to demonstrate, before the end of this course module, that they have attained knowledge about the following points of particular importance:

- understanding of real-world food production processes;
  - developing awareness of the technological and sustainable development factors that influence food systems;
  - familiarizing with organisational and managerial aspects of food-related activities.
- and capacity to apply knowledge:
- analysing production processes and sustainability practices observed during field visits;
  - contributing to the identification of improvement strategies for implementing the sustainability of food systems;
  - critically reflecting on innovation pathways in relation to ecological transition.

### **The academic activity is offered in:**

#### **Scienze Gastronomiche**

<b>Program type:</b>	<b>Program: (Curriculum: )</b>	<b>Curriculum:</b>	<b>Credits:</b>	<b>Sector:</b>
Bachelor or equivalent first cycle	Food Tech for Ecological Transition (2026)comune		3	NN

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# Food processing [ SG419 ]

Academic Activity a.y. 2027/2028

**Lecturer(s):** MARIA PIOCHI

**Time period:** Primo Ciclo Semestrale

## Learning objectives:

The course "Food Technologies (Mod. 1 – Food Processing)" will prepare students to:

- understand the theoretical foundations of food processes and unit operations;
- critically analyse the technological factors affecting food quality;
- identify and discuss possible critical issues related to the production process and/or the final product;
- operate in support of the management of food processes;
- contribute to the development of innovative solutions in food processing and product design.

At the end of the course, students will be able to:

- know the principles of food preservation;
- identify the main phases of food transformation within food processes;
- support the identification of suitable food processing and preservation technologies;
- contribute to identifying strategies for product innovation.

## Prerequisites:

It is recommended that students attending this course have a basic knowledge of food chemistry developed through the course 'Food Chemistry'.

## Course contents:

**Program**

### PRINCIPLES OF FOOD TECHNOLOGY

Definitions (unit operation, flow diagrams, preservation and processing technologies, elements of production process management)

Classes of unit operations

Principles of food preservation and transformation

Introduction to production process management

### FOOD PROCESSES AND MAIN FOOD CHAINS

Milk and dairy products

Cereals and derived products

Fats and oils

Alcoholic beverages

### INNOVATION IN THE FOOD INDUSTRY AND EMERGING TECHNOLOGIES

Definitions and typologies

Case studies

Group presentations and exercises

Note: The programme is to be considered as a forecast and may be subject to minor changes according to specific class needs.

**Teaching method**

Teaching activities include lectures, class discussions, and group work.

Teaching language: English

**Criteria, rules and procedures for the exam**

For full-time students

The exam consists of an oral test in English lasting approximately 15–20 minutes, including questions on the topics covered during the course. The exam aims to assess the knowledge acquired and the student's ability to apply it to specific cases. No notes or books may be used during the exam.

To verify learning outcomes, the examination will assess knowledge of food technology processes through:  
the ability to outline one or more food processes using flow diagrams;

the knowledge of the factors influencing the process, demonstrated through the description of process management (e.g. process variables such as time/temperature of treatments, machinery and equipment used);  
the student's critical ability to compare different processes and highlight their effects on final product quality.

Examination procedures may vary depending on student attendance (in compliance with university regulations). For students exceeding 30% of absences, an additional task is required, consisting of reading selected scientific articles (available on Moodle) agreed upon with the lecturer.

For students not exceeding 30% absences, the final grade may include results from intermediate evaluations (according to rules approved by the Academic Council):

80% from the final oral exam;  
20% from group presentations.

Evaluation criteria will be: in-depth and accuracy of knowledge of the topics; precision and completeness of answers; critical thinking and logical structure of exposition; autonomy in developing responses; ability to use appropriate technical language.

For part-time students

The exam consists of an oral test in English on the topics covered in the programme and will be graded out of 30.

The same evaluation criteria as for full-time students apply, with the oral exam representing 100% of the final grade.

### **Recommended readings:**

For full-time students

A dedicated set of teaching materials will be developed for this course, which does not fully coincide with published textbooks. Materials will be made available to students before each lecture via the designated online platform and organised by topic.

For efficient consultation, students are encouraged to refer to the course syllabus available on the same platform.

For part-time students

A dedicated set of teaching materials will be developed for this course, which does not fully coincide with published textbooks. Materials will be made available to students before each lecture via the designated online platform and organised by topic.

For efficient consultation, students are encouraged to refer to the course syllabus available on the same platform.

### **Further readings:**

**Learning objective**

The professional profile of graduates in "Food Tech for Ecological Transition" operates in contexts supporting the sustainable analysis and optimisation of production processes, as well as the design of innovative food products and processes. Such professionals are typically expected to:

- be able to select agri-food products according to quality criteria;
- support the identification of product and process innovation strategies;
- interact and communicate effectively with professionals from various areas of production, such as marketing, R&D, and quality control of agri-food products.

At the threshold level, this figure must be able to:

- understand the principles of food technologies related to food preservation and transformation;
- identify the main stages of food processing;
- possess the theoretical bases to understand and promote potential strategies for product innovation.

This course module proposes providing at the basic level:

- Skills aimed at supporting the management of a production process;
- Skills in supporting the implementation of sustainable and innovative product development;
- Skills related to product and process design and improvement.

**Response to the learning objective**

With the aim of demonstrating the effective preparation for the threshold competencies the student will be asked to demonstrate, before the end of this course module, that they have attained knowledge about the following points of particular importance:

- understanding the main technological factors affecting the transformation and preservation of food matrices during production processes;

- understanding the main food technology processes;
- understanding the main technological approaches for product innovation.

and capacity to apply knowledge:

- supporting the analysis and management of technological factors influencing the transformation and preservation of food matrices
- contributing to the management of main food technology processes to optimise product quality and safety;
- suggesting potential strategies for sustainable product and process innovation.

**The academic activity is offered in:**

**Scienze Gastronomiche**

<b>Program type:</b>	<b>Program: (Curriculum: )</b>	<b>Curriculum:</b>	<b>Credits:</b>	<b>Sector:</b>
Bachelor or equivalent first cycle	Food Tech for Ecological Transition (2026)comune		6	AGRI-07/A

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## **Food technologies [ SG418 ]**

**Academic Activity a.y. 2027/2028**

**Lecturer(s):**

**Time period:** Primo Ciclo Semestrale

**Syllabus not published by lecturer.**

**The academic activity is offered in:**

**Scienze Gastronomiche**

<b>Program type:</b>	<b>Program: (Curriculum: )</b>	<b>Curriculum:</b>	<b>Credits:</b>	<b>Sector:</b>
Bachelor or equivalent first cycle	Food Tech for Ecological Transition (2026)comune		0	AGRI-07/A

*Printed on: 19/02/2026*

# Psychology, food behaviour and technology [ SG425 ]

Academic Activity a.y. 2027/2028

**Lecturer(s):**

**Time period:** Secondo Ciclo Semestrale

## Learning objectives:

The course "Psychology, food behaviour and technology" prepares students for:

- Designing experiences and strategies for food sustainability;
- Analyze consumer and behavioral insights for businesses/public organization (analysis of consumer behavior, impact assessment of interventions and policies);
- Possess knowledge of the main behavioral research tools.

At the end of the course, students will be able to:

- Understand the psychological and neurocognitive basis of decision-making processes and consumer behavior;
- Recognize the impact of heuristics, emotions, and contextual factors on food choices;
- Analyze how multisensory and cross-modal perception influences preferences and expectations;
- Apply psychological models and perceptual principles to the interpretation and design of food experiences and consumption strategies;
- Master basic knowledge of the psychology of eating behaviors with reference to consumption dynamics;
- Apply tools and strategies based on knowledge of decision-making processes to disseminate practices/innovations related to sustainability;
- Integrate knowledge of cognitive psychology, neuroscience, and physiology to design interventions/initiatives/products that promote sustainable eating behaviors;
- Collaborate in interdisciplinary teams, translating technical and scientific knowledge into messages that are understandable to different stakeholders.

## Prerequisites:

No specific prior knowledge is required to attend the course. A general interest in psychology, perception, and eating behavior is recommended.

## Course contents:

**Program**

The course "Psychology, Food Behavior, and Technology" is an interdisciplinary course that investigates how and why we choose what we eat, linking the physiological mechanisms that regulate appetite and satiety to the cognitive processes that guide consumer behavior.

Starting from the neurocognitive basis and an evolutionary framework of the human-food relationship, the course shows how bodily signals and environmental elements shape our daily food intake and preferences.

Building on these foundations, the course delves into multisensory perception and cross-modal integration, exploring how sight, hearing, smell, taste, and touch shape our expectations, experiences, and judgments about food. Through practical examples, students learn to recognize how sensory signals—whether intrinsic to the product or extrinsic to the context—influence the formation of preferences and purchasing decisions.

The main models and theories of consumer psychology will be presented along with the main research tools used in the field.

The course then introduces the main models of decision making and consumer psychology, integrating psychological, cognitive, and neuropsychological perspectives: dual processes, heuristics and biases, bounded rationality, and the role of emotions and contextual and social factors. Nudge Theory and the principles of choice architecture will be introduced, with cases applied at the individual and collective levels.

**Teaching method**

The course combines lectures, interactive discussions, case studies, and exercises to connect theory and practice. Students will critically analyze real-world examples and participate in experiential activities to understand how psychological principles influence consumer behavior.

By the end of the course, participants will have acquired conceptual and methodological tools to interpret decision-making processes from a transdisciplinary perspective and to design interventions that promote healthier, more effective, and sustainable food choices.

Teaching Language: English

**Criteria, rules and procedures for the exam**

For full-time students

The exam consists of a 60-minute written test with multiple-choice and open-ended questions and a group assignment assigned by the instructor.

The exam procedures are partially differentiated depending on whether students have had more or less than 30% absences (in accordance with University regulations). In particular, students who have exceeded this threshold will be required to complete additional coursework agreed in advance with the instructor. Only for students who have not exceeded the 30% absence threshold, the final grade may be supplemented by grades obtained in midterm exams (in accordance with the rules approved by the Academic Council).

The assessment criteria will be as follows:

60% of the mark for the written exam, 40% of the mark for group work; participation in the scheduled teaching activities and exercises will also be taken into account.

For part-time students

The exam consists of a written test with multiple-choice and open-ended questions lasting 60 minutes, based on the course material.

The assessment criteria will be as follows:

100% of the grade will be based on the written test

### **Recommended readings:**

For full-time students

Special teaching material has been developed for this course, which does not completely coincide with texts available on the market.

Exercises: before each lecture, the lecturer will indicate to the students the material to be studied, in order to carry out in-class exercises and/or discussions related to it.

For part-time students

Special teaching material has been developed for this course, which does not completely coincide with texts available on the market.

Exercises: before each lecture, the lecturer will indicate to the students the material to be studied, in order to carry out in-class exercises and/or discussions related to it.

### **Further readings:**

**Learning objective**

The professional profile of a graduate in "Food Tech for Ecological Transition" working in the domain of food psychology and eating behaviour supporting the ecological transition is typically tasked with:

- analysing eating behaviours and their determinants (physiological, psychological, social and environmental) using evidence-based approaches;
- supporting the identification, testing/piloting and evaluation of behavioural and communication innovation strategies aimed at health and sustainability;
- interfacing and collaborating with professionals from diverse areas (marketing, R&D, quality/safety, communication, data analytics, nutrition/public health), translating psychological evidence into design requirements and impact metrics.

At threshold level, this profile must be able to apply consumer-psychology methods and understand the main mechanisms governing eating behaviours, and possess the theoretical foundations to promote sustainable product/service/experience innovation strategies (acceptability, health, food-waste reduction).

**Response to the learning objective**

With the aim of demonstrating the effective preparation for the threshold competencies the student will be asked to demonstrate, before the end of this course module, that they have attained knowledge about the following points of particular importance:

- the main cognitive mechanisms underlying food choices;
- the principles of multisensory perception and crossmodal integration, and their influence on expectations, preferences, and decisions;
- the foundations of decision-making processes and choice architecture, and their ethical and communicative implications;
- the core investigative tools and methods for consumer research.

and capacity to apply knowledge:

- support the analysis and management of key behavioural and communication levers to steer healthier and more sustainable choices;
- propose sustainable product, process, and experience innovation strategies, collaborating within interdisciplinary teams;
- translate psychological and sensory evidence into operational recommendations and into metrics to assess impacts on health, sustainability, acceptability, and food-waste reduction.

**The academic activity is offered in:**

**Scienze Gastronomiche**

<b>Program type:</b>	<b>Program: (Curriculum: )</b>	<b>Curriculum:</b>	<b>Credits:</b>	<b>Sector:</b>
Bachelor or equivalent first cycle	Food Tech for Ecological Transition (2026)comune		6	PSIC-01/A

*Printed on: 19/02/2026*

# Sensory perception and acceptance of foods from emerging technologies [ SG420 ]

Academic Activity a.y. 2027/2028

Lecturer(s):

Time period: Primo Ciclo Semestrale

The academic activity is offered in:

Scienze Gastronomiche

Program type:	Program: (Curriculum: )	Curriculum:	Credits:	Sector:
Bachelor or equivalent first cycle	Food Tech for Ecological Transition (2026)comune		6	AGRI-07/A

Printed on: 19/02/2026

# Smart packaging [ SG426 ]

Academic Activity a.y. 2027/2028

**Lecturer(s):**

**Time period:** Secondo Ciclo Semestrale

## Learning objectives:

The course 'Smart Packaging' aims to prepare students for the design of food packaging (primary, secondary, and tertiary) and the management of its development, from a sustainable and accessible production and use perspective.

This teaching draws on the contributions of two disciplines: Industrial Design and Materials Science and Technology. They will be organised in two separate teaching modules, but they will work together in an integrated approach to prepare students for the challenges of smart food packaging design. In this case, the concept of smartness covers the formal, functional, material and technological aspects that, together, determine the performance system necessary for the management, valorisation and protection of the food product, in relation to its various users (use; management; production; social, economic, and environmental context) and throughout its entire life cycle, "from cradle to cradle".

At the end of the course, students will possess the cultural tools and skills to contribute to the design of packaging products with critical awareness of the users' requirements and of the possibilities and constraints related to the regulatory frameworks; they will also be able to integrate that perspective with the one dealing with the nature, properties, and functionality of the materials, as well as the potential of processing technologies at the service of the project.

## Prerequisites:

It is recommended that students attending this course should already have:

- critical and reflective skills in order to be able to make qualitative and quantitative assessments;
- analytical skills;
- ability to work in a team of people with profiles that value different experiences;
- how to analyze, correlate and communicate data clearly
- how to effectively present a project proposal;
- knowledge of English, sufficient to read and understand academic texts in the language.
- basics knowledge in chemistry and economics of Sustainable Development and Technological Innovation

## Course contents:

Program

Students will benefit from both theoretical and practical experiences of the following topics:

- methods and dynamics of the packaging design process;
- requirements-performance system and users system;
- affordability and usability of solutions;
- safety, identity, protection and enhancement of the food product and brand;
- environmental impact of the product, production, use and disposal;
- current legal, commercial and health regulations;
- innovation possibilities offered by research into materials and technologies for food products;
- the main categories of materials and their classification according to structure and properties
- software to choose the most suitable materials for the project requirements;
- design of a packaging product, its supply chain and its life cycle information;
- three-dimensional design, testing, feasibility assessments, and executive design;
- representation of the design process and design choices.

Teaching method

Teaching language: English

The teaching includes both theoretical lectures and exercises, in which teaching, experimentation and case study research will alternate. Students will carry out project work in groups, which will be assessed during the examination. Lectures and exercises will take place in person.

The knowledge and skills are acquired by the students, for each training area, through:

- 1.5 CFU: lectures, site visits, and other teaching experiences, making use of the slides and other teaching material.
- 1.5 CFU: classroom exercises and review (individual and collective) dedicated to the exercises.

Criteria, rules and procedures for the exam

For full-time students

Three exercises are planned, each contributing 10% to the examination grade, concerning:

The disassembly of packaging belonging to a specific product category.

The collection of case studies and best practices in the product sector of exercise 1.

The use of software to deepen knowledge, understanding, and choice of the most appropriate materials for the packaging sector.

The remaining 70% of the evaluation is related to:

- verification of each student's knowledge of the theoretical contents delivered during the lectures of the two disciplinary modules (30%). This will take place during an oral interview, through no less than two questions for each of the two disciplinary modules.
- Development of a group project work and its discussion in the examination (40%).

The grade will be single, expressed in thirtieths and will be the result of the integration of the individual assessments above (each in thirtieths). In order to access the discussion of the project work, it is necessary that the exercises' assessments are all sufficient and the project work is adequately developed.

For part-time students

Three exercises are planned, each contributing 10% to the examination grade, concerning:

The disassembly of packaging belonging to a specific product category.

The collection of case studies and best practices in the product sector of exercise 1.

The use of software to deepen knowledge, understanding, and choice of the most appropriate materials for the packaging sector.

The remaining 70% of the evaluation is related to:

- verification of each student's knowledge of the theoretical contents delivered during the lectures of the two disciplinary modules (30%). This will take place during an oral interview, through no less than two questions for each of the two disciplinary modules.
- Development of a group project work and its discussion in the examination (40%).

The grade will be single, expressed in thirtieths and will be the result of the integration of the individual assessments above (each in thirtieths). In order to access the discussion of the project work, it is necessary that the exercises' assessments are all sufficient and the project work is adequately developed.

### **Recommended readings:**

For full-time students

In addition to the teaching material provided, such as slides, lecture notes, and laboratory/experimental notes, the following bibliography is recommended for further study of key topics:

- Klimchuk, M., and Krasovec, S. (2006). Packaging Design, Edition 2nd-2013. Hoboken, NJ: John Wiley and Sons.
- Adducci, B., and Keller, A. (2008). Design Matters: Packaging 01 An Essential Primer for Today's Marketplace, Edition 8. Beverly, MA: Rockport Publishers.

For part-time students

In addition to the teaching material provided, such as slides, lecture notes, and laboratory/experimental notes, the following bibliography is recommended for further study of key topics:

- Klimchuk, M., and Krasovec, S. (2006). Packaging Design, Edition 2nd-2013. Hoboken, NJ: John Wiley and Sons.
- Adducci, B., and Keller, A. (2008). Design Matters: Packaging 01 An Essential Primer for Today's Marketplace, Edition 8. Beverly, MA: Rockport Publishers.

### **Further readings:**

Learning objective

In order to address the challenges of "Food Tech for Ecological Transition", the expertise in "Smart packaging" deals with:

- Design and control the process of protection and valorisation of food products and their value chain.
- Assessment of feasibility through an interdisciplinary approach (Design and Material Science and Technology).

The expert in "Smart packaging" must be able to design packaging products with a critical knowledge and consciousness about the choice of appropriate materials and technology, safety and regulatory frameworks. This teaching provides:

- Competences aimed at applying an integrated PSS (product-service-system) perspective to guarantee food safety, waste reduction and materials/energy optimization.
- Competences to make conscious choices about solutions, strategies and processes, explain them and report results clearly and critically.

Response to the learning objective

The student will be asked to demonstrate, before the end of this course module, that they have attained:

- knowledge about the following points of particular importance:
- The main by-product streams in a selected food supply chain and their characteristics.
- Core design strategies, principles, materials and technologies for product and value chain valorisation alongside

the life cycle.

and capacity to apply knowledge:

- Design a valorisation system and justify choices for specific packs and specific use of materials and resources among alternatives.
- Plan and execute a design process and to identify food-compatible and consumer-safe materials and packaging solutions.
- Communicate choices, results clearly in oral form, comparing alternatives and arguing a reasoned recommendation.

**The academic activity is offered in:**

### **Scienze Gastronomiche**

<b>Program type:</b>	<b>Program: (Curriculum: )</b>	<b>Curriculum:</b>	<b>Credits:</b>	<b>Sector:</b>
Bachelor or equivalent first cycle	Food Tech for Ecological Transition (2026)comune		6	IMAT-01/A, CEAR-08/D

*Printed on: 19/02/2026*

# Systemic design and circular economy for food [ SG421 ]

Academic Activity a.y. 2027/2028

**Lecturer(s):**

**Time period:** Primo Ciclo Semestrale

## Learning objectives:

The teaching "Systemic Design and Circular Economy for Food" introduces approaches that identify the relationships between the parts of a system, and the intrinsic value of these parts, as the elements that generate the system itself and can make it thrive. These approaches take the form of the sustainable management of material, energy, and information flows in order to develop open systems inspired by the dynamics of nature. According to this model, the output of one process becomes the input for another, avoiding waste production, reducing the ecological footprint and generating new social, economic and environmental value.

This teaching benefits from different disciplinary perspectives (Systemic Design for Sustainable Food Transitions and Regenerative and Circular Approaches to Food Production) that collaborate with an integrated approach.

## SYSTEMIC DESIGN FOR SUSTAINABLE FOOD TRANSITIONS

During the course, students will be guided in the experimentation and acquisition of the following knowledge and skills: to be aware of the complexity, relationships and interconnections that characterise food systems; understanding the Systemic Design approach and methodology applied to these systems; to map a food supply chain holistically, by analysing its actors, relationships and flows of matter, energy and information; to identify the challenges that characterise the analysed system and to explore the most suitable opportunities for the development of a new systemic model; to outline a future vision for the analysed food system, hypothesising its impacts and development.

## REGENERATIVE AND CIRCULAR APPROACHES TO FOOD PRODUCTION

The teaching provides fundamental knowledge, on the valorization of by-products in the food supply chain, using an integrated process-unit approach to minimize waste through material and/or energy recovery; it also includes hands-on activities focused on by-products from food production. The teaching will prepare students for designing and evaluating integrated valorization strategies within specific food chains, balancing technical feasibility with economic and environmental performance, and implementing practical recovery operations. After finishing the teaching, students will be able to identify the production steps of a selected food supply chain and propose methods to minimize the generation of scraps and waste; select the most suitable technologies for by-product valorization; understand processes for material recovery aimed at obtaining high-value molecules; and apply their knowledge to a specific food chain with clear, well-structured descriptions and a critical assessment of alternative valorization options.

## Prerequisites:

The following requirements are required in order to take part in the teaching activities:

- critical and reflective skills in order to be able to make qualitative and quantitative assessments;
- analytical skills;
- ability to work in a team of people with profiles that value different experiences;
- knowing how to analyse, correlate and communicate data clearly
- effective presentation of a project proposal;
- good knowledge of English, sufficient to read and understand academic texts in the language.

It is also recommended that students attending this teaching should already know the basics of chemistry and physics; be able to conduct literature searches on scientific websites; interpret, compare, integrate, and communicate data; and discuss results in a critical and constructive manner.

## Course contents:

Program

The course aims to provide the theoretical, methodological and design tools useful to address the complexity and challenges related to the environmental, social, cultural and economic sustainability of food systems. The focus is on food system design in which the output of one process becomes the input of another, thus defining new models of sustainable development for supply chains, their actors and contexts.

The SYSTEMIC DESIGN FOR SUSTAINABLE FOOD TRANSITIONS module provides the methodological and design tools for developing a systemic design. In detail, the lectures will explore the following topics: - Systemic

Design: Approach, Complexity Theories, Principles and Key Concepts; Systemic Design for the Food System - Systemic Design Methodology; Understanding Complexity (Holistic Survey); Addressing Challenges (Challenges and Opportunities); Designing the System, Evaluating the System.

The REGENERATIVE AND CIRCULAR APPROACHES TO FOOD PRODUCTION module provides the theoretical foundations of technologies and processes for the valorization of food-derived by-products. It covers major pathways for both material and energy valorization. Practical case studies will include, for example, extraction of high-value molecules and reuse of matrices for adsorption of contaminants in liquids, alongside additional hands-on valorization experiences.

Teaching method

Teaching language English.

Teaching is based on strong disciplinary integration to provide students with cross-curricular and synoptic content and experience of every issue concerning the sustainable development of food chains.

The module, meant as an experiential learning environment, is characterised by a “learning by doing” approach. Its multimodal structure includes:

- Theoretical and methodological lectures
- Thematic workshops
- In-class exercises/workshops to develop and write project proposals.
- Teamwork carried out throughout the project phase.
- Laboratory practices focused on the valorization of selected food by-products.
- In-depth discussions with food experts (national and/or international)
- Project reviews
- Field visits to local realities

Criteria, rules and procedures for the exam

For full-time students

The final exam consists of a plenary project presentation followed by a Q&A with the teaching team. The final grade is individual for each student. The overall grade, determined after the presentation and discussion of the final project and the answer to the questions, will be the weighted average of the grades obtained by the student in each of the two teaching modules. The final grade is individual for each student.

Exam procedures are partially differentiated according to whether students have had more or less than 30% absences (in compliance with the University regulations). In particular, for students who have exceeded this threshold an additional teaching load is envisaged, consisting of a written report explaining the laboratory activities carried out during the course. If they were absent from the laboratory, they will be assessed orally with questions designed to verify their understanding of the activities performed by their peers (to be agreed in advance with the lecturer) and agreed in advance with the lecturer. For students who have not exceeded the 30% absences threshold, the final grade may be supplemented by the marks obtained in interim assessment tests (in accordance with the rules approved by the Academic Council).

The assessment criteria will be as follows:

Ongoing activities and weekly reviews: 70%

Final deliverables and exam presentation: 30%

For part-time students

The final exam consists of a plenary project presentation followed by a Q&A with the teaching team. The final grade is individual for each student. The overall grade, determined after the presentation and discussion of the final project and the answer to the questions, will be the weighted average of the grades obtained by the student in each of the two teaching modules. The final grade is individual for each student.

Exam procedures are partially differentiated according to whether students have had more or less than 30% absences (in compliance with the University regulations). In particular, for students who have exceeded this threshold an additional teaching load is envisaged, consisting of a written report explaining the laboratory activities carried out during the course. If they were absent from the laboratory, they will be assessed orally with questions designed to verify their understanding of the activities performed by their peers (to be agreed in advance with the lecturer) and agreed in advance with the lecturer. For students who have not exceeded the 30% absences threshold, the final grade may be supplemented by the marks obtained in interim assessment tests (in accordance with the rules approved by the Academic Council).

The assessment criteria will be as follows:

Ongoing activities and weekly reviews: 70%

Final deliverables and exam presentation: 30%

### **Recommended readings:**

For full-time students

In addition to the teaching material provided, such as slides, lecture notes, and laboratory/experimental notes, the following bibliography is recommended for further study of key topics:

- Barbero, S. (2017). Systemic Design Method Guide for Policymaking: a Circular Europe on the Way. Allemandi. -

- Bistagnino, L. (2011). Design sistemico: progettare la sostenibilità produttiva e ambientale (2nd ed.). Slow Food Editore.
- Barilla Center for Food & Nutrition. (2016). Eating planet. Cibo e sostenibilità: costruire il nostro futuro. Edizioni Ambiente.
  - Giordano, A. (2023). FoodSystem 5.0. Agritech | dieta mediterranea | comunità. Edizioni Ambiente.
  - Marino, M., Pratesi C. A. (2022). Il cibo perfetto. Aziende, consumatori e impatto ambientale del cibo. Edizioni Ambiente.
  - Norman, D. (2023). Design for a Better World: How to create a meaningful, sustainable, and humanity-centred future. MIT Press.
  - Pauli, G. (2018). Economia in 3D. L'intelligenza della natura. Edizioni Ambiente.
  - Raworth, K. (2018). Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist. Penguin Random House UK.

For part-time students

In addition to the teaching material provided, such as slides, lecture notes, and laboratory/experimental notes, the following bibliography is recommended for further study of key topics:

- Barbero, S. (2017). Systemic Design Method Guide for Policymaking: a Circular Europe on the Way. Allemandi.
- Bistagnino, L. (2011). Design sistemico: progettare la sostenibilità produttiva e ambientale (2nd ed.). Slow Food Editore.
- Barilla Center for Food & Nutrition. (2016). Eating planet. Cibo e sostenibilità: costruire il nostro futuro. Edizioni Ambiente.
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- Raworth, K. (2018). Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist. Penguin Random House UK.

### Further readings:

**Learning objective**

In order to address the challenges of “Food Tech for Ecological Transition”, the expert in “Systemic Design and Circular Economy for Food” deals with working in the context of circular bioeconomy and sustainable food supply chains with the task of:

- Designing and optimizing processes, relations, and logistics for the valorization of food by-products (material and energy recovery).
- Assessing feasibility through systemic approach, basic techno-economic analysis, environmental evaluation (e.g., mass/energy balances, hotspots).

The expert in “Systemic Design and Circular Economy for Food” must be able to map a production chain according to a holistic perspective, its social, economic and environmental values and its by-product streams; select and justify suitable valorization technologies; plan and conduct simple laboratory trials; interpret, compare, and communicate data; apply safety and regulatory good practice; and present a concise project proposal with a critical discussion of alternatives.

This course module proposes providing, at the basic level:

- Competences aimed at applying an integrated PSS (product-service-system) perspective to minimize waste and recover materials/energy within a specific food chain.
- Competences in selecting and operating entry-level valorization strategies and processes (e.g., extraction of high-value molecules, reuse of matrices for adsorption, fermentation/biogas options), and explaining choices and reporting results clearly and critically

**Response to the learning objective**

With the aim of demonstrating the effective preparation for the threshold competencies, the student will be asked to demonstrate, before the end of this course module, that they have attained knowledge about the following points of particular importance:

- The main by-product streams in a selected food supply chain and their characteristics.
  - Core design strategies, principles and technologies for territory, material and energy valorization (e.g., extraction, adsorption, fermentation, anaerobic digestion).
  - Basics of mass/energy balances and introductory environmental/techno-economic evaluation.
  - Good laboratory practice, safety, and relevant regulatory concepts for by-product use.
- and capacity to apply knowledge:
- Design a valorization system and justify choices for specific use of resources among alternatives.
  - Plan and execute basic laboratory trials (e.g., extraction or adsorption) and process the resulting data.
  - Perform a preliminary feasibility screen (yield calculations, simple costs, and environmental hotspots).
  - Communicate choices, results clearly in oral form, comparing alternatives and arguing a reasoned recommendation.

### The academic activity is offered in:

Università degli Studi di Scienze Gastronomiche - P.zza Vittorio Emanuele, 9 - 12060 Bra

## Scienze Gastronomiche

<b>Program type:</b>	<b>Program: (Curriculum: )</b>	<b>Curriculum:</b>	<b>Credits:</b>	<b>Sector:</b>
Bachelor or equivalent first cycle	Food Tech for Ecological Transition (2026)comune		10	CEAR-08/D, ICHI-02/A

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