

CORSO DI LAUREA IN SCIENZE ALIMENTARI ED ENOGASTRONOMICHE
BACHELOR IN LEBENSMITTELWISSENSCHAFTEN, ÖNOLOGIE UND GASTRONOMIE

Contenuto degli insegnamenti Inhalt der Lehrveranstaltungen

Primo anno / Erstes Jahr
<p>Elements of mathematics and statistics (8 credits – EN)</p> <ul style="list-style-type: none"> • Elementi di aritmetica e di algebra (algebra delle frazioni, potenze con esponente intero e razionale, studio di semplici equazioni algebriche) • Elementi di geometria euclidea del piano e dello spazio (aree, volumi, piano cartesiano) • Elementi di probabilità e statistica (in particolare, concetto di popolazione, campione, distribuzioni discrete, media, moda, mediana) • Cenni di analisi reale (funzioni elementari, logaritmiche, esponenziali, limiti e derivate e loro significato) • Semplici modelli matematici (ad es., relativi a meccanismi riproduttivi dei batteri o a reazioni chimiche) <ul style="list-style-type: none"> - Elements of arithmetic and algebra (algebra of fractions, powers with integer and rational exponent, study of simple algebraic equations) - Elements of Euclidean geometry of plane and space (areas, volumes, Cartesian plane) - Elements of probability and statistics (in particular, the concept of population, sample, discrete distributions, mean, mode, median) - Hints of real analysis (elementary, logarithmic, exponential functions, limits and derivatives and their meaning) • Simple mathematical models (e.g. related to reproductive mechanisms of bacteria or chemical reactions)
<p>Sustainable management and environmental impact of livestock production systems</p> <p>Module 1: Introduction to Livestock Farming and its Environmental Impacts (3 credits - DE) Livestock production in Europe (Structures of animal production in mountain areas) Competition for space and sustainability Livestock production systems (Calves, dairy cattle and beef cattle, Sows and fattening pigs, Laying hens and fattening poultry, Sheep and goats) Environmental impacts of livestock: challenges and solutions for environmental friendly production systems</p>
<p>Module 2: Sustainable Livestock Farming and Breeding Measures for Quality Products (5 credits - DE) Domestication of modern livestock species Basic concepts of animal breeding and its relevance for food quality Fundamentals of population and molecular genetics (basics, population parameters, breeding value, selection, selection methods, inbreeding, breeding methods) Organisation of animal breeding incl. breeding programmes and breeding strategies</p>

Principles of General, Organic, and Biological Chemistry for Food Science

The course provides foundational knowledge of chemistry and biochemistry as applied to food sciences. Students will explore key topics, including atomic theory, chemical bonding, chemical reactions, and the chemistry of macronutrients such as carbohydrates, lipids, and proteins. Aerobic and anaerobic metabolism will also be examined, highlighting their roles in energy production and food systems.

Module 1: General Chemistry and biochemistry (6 credits – EN)

This course introduces fundamental concepts of chemistry and biochemistry as they relate to food and wine sciences. Topics include measurements and calculations, matter and energy, atomic theory and the atom, chemical bonding, elements and ions, and nomenclature. It also covers chemical reactions, chemical composition, gases, and heavy metals residuals in food. The biochemistry section focuses on enzymes, carbohydrates and lipids, vitamins and minerals and introduces cellular biology and biochemistry. Topics related to cellular respiration include aerobic harvesting of energy, the stages of cellular respiration (glycolysis, the Krebs cycle, and the electron transport chain), and anaerobic respiration.

Module 2: Organic Chemistry (3 credits – EN)

Properties and nomenclature of organic compounds

Alkanes, alkenes, alkynes.

Stereochemistry and chirality.

Alcohols, phenol, ether, thiols

Aldehydes and ketones

carboxylic acids and derivatives

amines.

Benzene and aromatic compounds.

Structure and function of bioorganic molecules (e.g., proteins, DNA)

Physics and computer science

Module 1: General physics and fluid physics for the Food industry (3 credits DE)

Introduction to general physical concepts, unit systems and coordinate systems.

Overview of classical mechanics focusing on kinematics and dynamics.

Behaviour of fluids and gases including their density, viscosity, and flow.

Applications of non-Newtonian fluid mechanics for the food industry

Module 2: Applied computer science (3 credits DE)

Computer fundamentals (information and data, information representation and processing, hardware, operating system, networking)

Spreadsheets (basics, numerical and visual summaries, advanced functions)

Programming (introduction, conditional statements, loops)

Plant biodiversity and sustainable cultivation methods

Module 1: Plant biodiversity and environmental impact assessment (6 credits EN)

- Basic knowledge of biodiversity, agrobiodiversity, with particular regard to vegetation, ecosystems, land-use systems, and landscapes
- Overview on concepts, methods, and approaches of plant diversity assessment
- Structure and functions of plant organs
- Basic information on plant systematic
- Overview on edible plants of mountain areas with examples, referring to their ecology
- Sustainable foraging and wild edible plants
- Ecosystem restoration for useful plants
- Wild plant identification in the lab and in the field

Module 2: Sustainable cultivation methods and quality of products for food processing (3 credits EN)

The educational objectives of the module "Sustainable cultivation methods for quality production" are to provide students with scientific and technical knowledge on the main principles of primary production. In detail, sustainable cultivation methods of production will be considered especially under the framework of the mountain environment. Students will be provided with an overview on the main aspects of products' quality and technologies to obtain and maintain quality of agricultural products.

Biology of microorganisms and secondary metabolites (8 credits EN)

Module 1: Biology and Biotechnology of Food Microorganisms (6 credits EN)

The part of the course dealing with the biology of food related microorganisms covers the elements of biology, cytology and biochemistry of microorganisms, the more technical aspects of cultivation, growth, isolation and identification of microorganisms and their taxonomic classification.

The part of the course dealing with the biotechnology of food microorganisms covers aspects of microbial ecophysiology, the determination and control of microorganisms in food, as well as the distribution of microorganisms in food as well as the distribution of spoilage and pathogenic microorganisms in plant- and animal-based food.

Module 2: Secondary metabolites (2 credits EN)

This course deals with the definition and role of secondary metabolites in food, considering, mainly focusing on their functions in terms of health benefits. Emphasis will be placed on understanding key classes of metabolites, including alkaloids, flavonoids, terpenes, glucosinolates, and tannins, with examples from plant and fungal sources. Case studies will illustrate how these metabolites enhance product quality and offer functional health benefits.

Food systems (6 credits DE)

This course aims to provide a comprehensive understanding of modern food (supply) systems, emphasizing both general and current scientific insights, always from an agricultural and food economics perspective. Students will gain foundational knowledge of the complexity inherent in these systems. Topics covered include an introduction to global food provision challenges, such as population growth, urbanization, and resource management, as well as food demand and consumption patterns. Key areas of study also include farming structures and agricultural development, food distribution, and the role of food processing and the food industry. The course examines specific regional contexts like South Tyrol and addresses critical sustainability issues such as the competing demands for food, feed, and energy, the relationship between nutrition and health, and the impact of climate change on food supply. Additional topics include the importance of regionality, strategies to reduce food waste, and the development of sustainable food supply systems for the future. This holistic approach prepares students to analyze and engage with the challenges of modern food systems effectively.

Agri-Food marketing and law

Module 1: Food marketing (3 credits IT)

The food marketing module aims to provide students with basic knowledge of what marketing is and how this tool applies to the agri-food sector, from agricultural commodities to finished food products. The main objectives are:

First, provide students with a basic understanding of economic thinking, management thinking and decision making so as to introduce them to the world of the agri-food business;
Second, provide students with an understanding of the agri-food market and its actors, with particular attention to satisfying demand through the valorisation of agri-food products;
Third, provide students with basic market research tools to interpret and analyse demand patterns;
Fourth, provide students with new marketing tools and strategies to stay updated and cope with new trends and dynamics emerging from the agri-food market.
At the end of the course the student is able to critically and autonomously apply marketing concepts and tools for the valorisation of the agri-food product.

Module 2: Food law (3 credits IT)

The food law module will introduce students to the European and national regulation of the food sector. The main goals of the course are, on one hand, to offer a general overview of the different regulatory fields governing the production and marketing of food products and, on the other hand, to introduce students to the logic and functions characterizing the different rules that will be presented in class. In order to achieve such goals, analysis will focus not only on legislation, but also on court decisions and other policy materials. In particular, the module will cover the following issues:

- the regulation of food safety, including risk analysis, precautionary principle, traceability and HACCP
- the regulation on food quality, including PDO and PGI, as well as certification marks
- food labelling and consumer protection, including nutritional claims and health claims
- the regulation of food innovation, including gmos, novel food and food additives
- food sustainability, including organic regulation and other types of green claims

At the end of the module, students will be able to identify and apply the main legal tools employed to regulate food production and marketing.

Secondo anno / Zweites Jahr
Profilo tecnologie alimentari - Profil Lebensmitteltechnologie

Hygiene, food microbiology and food industries

Module 1: Hygiene and Food Microbiology (6 credits IT)

The aim of the course is to provide an integrated overview of food microbiology and hygiene covering food hygiene and safety issues in food production, distribution, and storage. In particular, the course provides insights into hygiene regulations for the prevention of food contamination, microorganisms and metabolites that are indicators of microbial quality and fermentation, pathogenic microorganisms and toxic substances associated with food, principles of physiology and biochemistry of lactic acid bacteria and yeasts and their application in traditional fermented foods (e.g. yoghurt, cheese, leavened bakery products, sauerkraut).

Module 2: Agro-food industries (6 credits IT)

For each food supply chain listed below, the production process of the main products is illustrated using a common teaching scheme which includes:

1. Definition of the food product
2. Characteristics of raw materials
3. Description of processing technology
4. Evaluation of the quality of the food product.

In detail, the course includes the following topics:

Technology of oils, fats and derivatives:

- Chemical and physical properties of edible oils and fats
- Classification of oils and fats
- Processing technologies
- Quality evaluation
- Production of speck.

Wine production technology:

- Characteristics of musts and wines
- Winemaking technologies
- Additives, coadjuvants, stabilization processes of wines
- Quality evaluation.

Milk and dairy products technology:

- Chemical and physical properties of milk
- Classification of dairy products
- Dairy products processing technologies Quality evaluation Brewing technology
- Characteristics of raw materials for beer production
- Types of beers and processing techniques
- Storage and quality assessment.

Plant genetics (3 credits DE – profile food technology)

The course gives insights into classic and molecular plant genetics as well as into biotechnological approaches used in modern plant breeding. In detail, the course starts with an introduction into classical mendelian genetics and thereafter explains the molecular mechanisms controlling heredity in plants. Next the course provides an introduction into functional genetics, forward and reverse genetics, and molecular biotechnology with a focus on genome editing in plants. The content will be explained using examples from crop plants and

Measurements and controls

Module 1: Measurements and regulations in fermentation (3 credits EN – profile food microbiology)

The course is aimed at acquiring knowledge in the field of industrial food microbiology, with reference to bioreactors and starter culture. It aims to provide knowledge on measuring the growth of microorganisms, their nutritional requirements and monitoring and conducting successful fermentation.

Module 2: Measurements and controls in food processing (3 credits EN – profile food technology)

The course offers in-depth knowledge and practical skills in industrial food processing, as well as advanced techniques for evaluating the quality of major food commodities. It focuses on equipping students with the ability to assess and measure key quality parameters, ensuring a comprehensive understanding of both theoretical and applied aspects of food quality management.

Specialized language (English)

Topics covered include a general revision of basic grammatical structures with subsequent consolidation through use of practical applications. Emphasis is placed on improving the four main skills (reading, writing, listening and speaking) through practical, communicative tasks.

General overview of grammatical structures at the B2/B2+ level;

Exploitation of authentic reading texts from the world of food, wine and agriculture;

- Vocabulary acquisition techniques; lexicogrammar; and word-building
- Writing skills: general writing skills to enable students to produce accurate connected texts in English at the B2/B2+ level, including emails (formal and informal), paragraphs, summaries and reports.
- Presentation skills.

Advanced enology and enography (6 credits IT)

The course provides theoretical and practical knowledge on the processing technology of dessert, flavored wines and other winery products, and other alcoholic and distilled beverages. Part of the lectures will be devoted to ingredients and coadjuvants used in enology. The detailed program includes selected topics in winemaking techniques and aging of wine. Cold maceration. Governo all'uso toscano. Copigmentation. The production of barrels. Innovative additives for winemaking. Carbon dioxide: physical chemical properties. Fortified and flavored wines. Vermouth. Dessert wines. Production technology of selected fortified and dessert wines: Vernaccia di Oristano, Marsala, Porto, Madeira, Sherry, Tokaj and Sauternes and others. Wine spirits and brandy: classification. Distillation principles and practices. Characteristics of raw materials, fermentation, distillation and aging. Pomace fermentation. Grappa, Cognac, Armagnac, Whisky, Rhum, Tequila, Sakè and other distilled beverages. Liquors and bitters. Production technology of vinegar and aceto balsamico. Laboratory workshop on selected topics of wine analysis. Visit to wineries, scientific symposia and/or fairs on wine technology and equipment.

The part of enography includes the different characteristics and winemaking technologies of wines produced in different viticultural regions.

Nutrition physiology (6 credits IT)

The course will provide knowledge on the anatomy and physiology of the digestive tract, on the principles at the basis of the digestion and absorption of macronutrients and will discuss the function and quality of macro- and micronutrients, water, and alcohol. The course will also provide the basics of the nutritional quality of foods and define and provide insights on the concept of "food group". The "dietetics" part of the course will provide knowledge on energy requirements and energy balance between daily intake and energy expenditure. The program will then discuss the energy and nutrient needs of the population and scientific basis to estimate nutrient requirements and the recommended dietary allowances for the Italian population (LARN), the national Dietary Guidelines for the Italian population. Additional topics will be: food labelling, healthy dietary patterns, healthy and sustainable diet. A final focus will then be on the concepts of food allergy and food intolerance, with a basic explanation of the mechanisms underlying these phenomena and effective ways to face them from a nutritional standpoint.

Unit operations (6 credits IT – profile food technology)

The course aims to provide concepts related to the phenomenological understanding of the main unit operations in the food industry. It focuses on describing the operating principles of equipment used in food processing. Analyzing the functioning of these units provides the foundational background for understanding food processes and their impact on product quality.

The course has the following learning objectives:

identify the unit operations of a food processing

understand the main process parameters

analyze the process, describe the governing variables, write and solve mass and energy balances, and predict food modifications.

Instrumental analytical techniques (6 credits DE – profile food technology)

The course provides a comprehensive introduction to the fundamentals of quali-quantitative analytical and instrumental chemistry, enabling students to select appropriate methods based on specific problems and to assess the potential applications of modern analytical procedures. Through an in-depth exploration of analytical processes, sample preparation, and essential analytical methods, students will develop the skills necessary to make informed decisions in various analytical contexts. The course covers key topics including the foundations of analytical chemistry, with a focus on the analytical process, as well as the application of statistical methods and probabilities in analytical procedures. It also delves into the principles and techniques of sample preparation, chromatography, liquid chromatography, gas chromatography, mass spectrometry, infrared spectroscopy, and electron ultraviolet-visible spectroscopy. Additionally, the course examines advanced coupling techniques, such as the integration of liquid chromatography with mass spectrometry and gas chromatography with mass spectrometry. The integrated approach of teaching and lab work ensures that students acquire both theoretical knowledge and practical insights into the field of analytical chemistry.

Business organization in enogastronomy (6 credits DE - profile enogastronomy)

The course provides a general overview of the topics of Organization and Human Resource Management. The first part of the course will focus on the topics of Organization, the second part on the topics of Human Resource Management. Both topics are related to the praxis. Exercises, case studies, and student presentations enhance the learning of the topics.

Management of supplying, working and maintenance processes of catering companies (6 credits IT – profile enogastronomy)

The course aims to provide knowledge on the sizing criteria of facilities and equipment for collective catering and skills on the main regulations on the safety of facilities and equipment. It also aims to analyse the main logistical models used in the catering sector and to understand the principles governing sustainable development and sustainability along the food chain.

Students will have the ability to: recognise the different types of catering facilities; size the spaces, facilities and equipment needed to organise a catering premises; assess the safety status of the equipment and the level of logistics present. They will also have skills to deal with issues related to waste reduction/management and to assess the sustainability of raw materials and menu formulations. Finally, they will be able to assess economic management, with reference to energy, facilities and operator safety, user welfare and environmental impact.

Seminar: Cook the Mountain (7 credits DE - profile enogastronomy)

seasonal programming of kitchen processes

suppliers and products, a relationship to be built

organisation of time and resources

how to deal with food (vegetables, wild herbs, meat, cheese, cereals...)

cutting techniques

preservation methods (fermentation, drying, maturing...)

cooking techniques (smoking, low temperatures...)

use of tools

case studies in sensory food analysis

case studies of food chemistry and physics

The values guiding the entire course are:

To create a transversal research laboratory on gastronomy which investigates the values which, at a global level, unite culturally and socially the people who live the mountains as a resource, passion, challenge and heritage to be protected.

To promote a new way of experiencing the relationship between cuisine and the mountains (on an international level) based on ethics and conviviality, environmental sustainability and territorial development. Promote mountain cuisine as a "catalyst for cultural processes", for the diffusion of a new model of sustainable development.

Terzo anno / Drittes Jahr

Profilo tecnologie alimentari - Profil Lebensmitteltechnologie

Food Quality Evaluation

Module 1: Sensory analysis and tasting techniques (6 credits EN)

The course gives a general overview of scientific contents and is designed for acquiring professional skills and knowledge to develop projects related to sensory analysis and tasting of enogastronomy products. The list of topics include: fundamentals of sensory analysis. Physiology of human senses; descriptive analysis; effects of processing on the sensory properties of enogastronomy products (food and wine). Development of procedures for defining a sensory profile. Construction of a profile sheet, theory and practical tests. Principles of selection and training of tasters, physiological and psychological errors.

Module 2: Chemical and physical analysis of food products (6 credits EN)

This course provides an in-depth study of the techniques used to evaluate the quality of food products. Students will explore the basic aspects of food analysis, including physical and chemical analysis methods. The course aims to provide students with knowledge and skills to ensure food safety, quality, and integrity.

Educational objectives:

- 1) Comprehensive Understanding: By the end of the course, students should have a comprehensive understanding of the concepts of food quality.
- 2) Practical Laboratory Skills: Students should develop skills in chemical and physical analysis applied for food quality.
- 3) The students can describe the main analysis needed for quality control and how to report the results of the analysis.

Bioprocesses and Thermodynamics

Module 1: Bioprocesses and Microbial-derived Ingredients (6 credits IT)

The course is designed for acquiring knowledge in the field of bioprocessing addressed to produce tailored microbial-based food ingredients. It aims to provide knowledges on the role of solid- and liquid-state fermentation, immobilization of microbial cells or enzymes in the generation of compounds that can be used as food ingredients and food additives (e.g., proteins, amino acids, flavour enhancers, pigments, prebiotics and nutraceuticals). Moreover, the course provides the principles of use and operation of bioreactors.

Module 2: Fluid thermodynamics for foods (3 credits IT)

The module provides the fundamentals of thermodynamics and heat transfer, with their physical quantities and fundamental relations, in order to understand energy systems for the food sector.

The study of prime movers based on direct cycles and inverse cycle will be proposed. The aim of the module is to provide a complete frame of the technologies devoted to energy production and refrigeration for food conservation. Other processes, as evaporation and drying will be presented with their applications.

Technologies for Quality Assurance of Agricultural Products - Post-harvest Technologies 6 credits DE)

Technologien für die Qualitätssicherung landwirtschaftlicher Produkte – Nacherntetechnologien

The course offers a general overview of post-harvest technologies regarding primary production technology and conservation technologies. It will introduce students to the basic concepts and major processes that refer to the technology of food production and its conservation. The course aims to develop students' knowledge and mastering its application possibility for technological processes and their machines and devices, including: basic definitions of system engineering (machine, system, plant); summarizing overview of physical basics; fundamentals of energy technology, engineering fundamentals of agricultural machinery and equipment; mechanization of a farm (tractors, machines and equipment for outdoor and indoor farming with a special focus on post-harvest technologies and logistics); Quality of agricultural products – definitions; diversity of primary agricultural products and their quality assurance requirements; basics of preservation technologies (physical, chemical, biological); basic techniques in the post-harvest technologies sector; motors and drives (hydraulic, pneumatic, electric); parts/components for power transmission; systems for the transportation of products in solid phase, liquid phase; systems for refrigeration and heat generation; systems for the distribution and utilization of electrical energy; measurement and control technology in post-harvest technology processes (parameters and sensors, process control and software); application examples.

Protection of stored products

Module 1: Stored product pests (3 credits DE)

The course imparts basic knowledge in the field of protection of stored product protection. The list of topics include: Basics of healthy food production, Basics of plant protection, Biology of the most important storage pests on stored cereals, fruit and vegetables, Quantitative and qualitative effects of pest infestation, Monitoring and infestation detection, Preventive measures, Biological control methods, Chemical control methods

Module 2: Postharvest pathology (3 credits DE)

The module provides basic knowledge in the field of stored product protection focusing on postharvest pathology. An overview of the most important postharvest pathogens of fruit, vegetables and grain is provided, the principles of integrated control of postharvest diseases are introduced and different methodological approaches for the control of postharvest diseases are covered.

Specifically, the following topics will be addressed:

Introduction to postharvest pathology

Postharvest pathogens and diseases of selected crops

Mycotoxins

Introduction to integrated control of postharvest diseases

Physical methods for the control of postharvest diseases

Chemical methods for the control of postharvest diseases

Biological methods for the control of postharvest diseases

New technologies for improving host resistance

Recognising and diagnosing post-harvest pathogens and diseases (exercises in the laboratory)

Secondo anno / Zweites Jahr
Profilo Enogastronomia - Profil Öngastronomie

Hygiene, food microbiology and food industries

Module 1: Hygiene and Food Microbiology (6 credits IT)

The aim of the course is to provide an integrated overview of food microbiology and hygiene covering food hygiene and safety issues in food production, distribution, and storage. In particular, the course provides insights into hygiene regulations for the prevention of food contamination, microorganisms and metabolites that are indicators of microbial quality and fermentation, pathogenic microorganisms and toxic substances associated with food, principles of physiology and biochemistry of lactic acid bacteria and yeasts and their application in traditional fermented foods (e.g. yoghurt, cheese, leavened bakery products, sauerkraut).

Module 2: Agro-food industries (6 credits IT)

For each food supply chain listed below, the production process of the main products is illustrated using a common teaching scheme which includes:

1. Definition of the food product
2. Characteristics of raw materials
3. Description of processing technology
4. Evaluation of the quality of the food product.

In detail, the course includes the following topics:

Technology of oils, fats and derivatives:

- Chemical and physical properties of edible oils and fats
- Classification of oils and fats
- Processing technologies
- Quality evaluation
- Production of speck.

Wine production technology:

- Characteristics of musts and wines
- Winemaking technologies
- Additives, coadiuvants, stabilization processes of wines
- Quality evaluation.

Milk and dairy products technology:

- Chemical and physical properties of milk
- Classification of dairy products
- Dairy products processing technologies Quality evaluation Brewing technology
- Characteristics of raw materials for beer production
- Types of beers and processing techniques
- Storage and quality assessment.

Geography of Food and Sustainable Regional Development (3 credits DE)

The course aims to introduce students to the basic theoretical approaches and relevant topics of food geography and sustainable regional development. In particular, the course participants will discuss and investigate the economic and social geographies of footpaths, food networks, and sustainable food production, processing, logistics, and consumption. The food geography issues covered in the course include the critical analysis of power constellations at global and regional levels—food regimes, food security, and food sovereignty; globalization and mechanisms of uneven economic and social development (connections and disconnections); strategies for “localizing” and “regionalizing” food (fair trade, DOP, terroir, etc.); the geographies of food consumption and food tourism; the creation of sustainable regional food economies in the context of sustainable regional development—agroecology, circular economy, food and environmental justice; and research methods of economic and social geography, which serve to analyze the food sector. The course will analyze and discuss specific case studies and examples, using the peculiar spatiotemporal geographic perspective on the economic, political, and social dimensions of the food sector. In small exercises the students will apply the discussed theoretical concepts and research methods, analyzing local contexts.

Food Anthropology (6 credits IT)

The course offers a general overview of sociocultural anthropology with regard to the study of food and foodways. It will introduce students to the basic concepts and major issues that have contributed to the anthropology of food and foodways. The course aims to develop students’ acquaintance with topics within food anthropology, including: anthropological categories of subsistence systems; symbolic dimensions of food; food and religion; food, embodiment and gender; food and identity; food, power, social status, and social hierarchy; globalization, food activism and cultural change in food and foodways; anthropological research methods for the study of food and foodways. The course will analyze specific examples and case studies, especially from within anthropology’s unique cross-cultural perspective, fostering a critical approach to describing and analyzing food and foodways in our contemporary globalized society. Through the exercise portion, it will also give students the opportunity to apply the theoretical part to the concrete analysis of local Alpine context.

Specialized language (English)

Topics covered include a general revision of basic grammatical structures with subsequent consolidation through use of practical applications. Emphasis is placed on improving the four main skills (reading, writing, listening and speaking) through practical, communicative tasks.

General overview of grammatical structures at the B2/B2+ level;

Exploitation of authentic reading texts from the world of food, wine and agriculture;

- Vocabulary acquisition techniques; lexicogrammar; and word-building
- Writing skills: general writing skills to enable students to produce accurate connected texts in English at the B2/B2+ level, including emails (formal and informal), paragraphs, summaries and reports.
- Presentation skills.

Advanced enology and enography (6 credits IT)

The course provides theoretical and practical knowledge on the processing technology of dessert, flavored wines and other winery products, and other alcoholic and distilled beverages. Part of the lectures will be devoted to ingredients and coadiuvants used in enology. The detailed program includes selected topics in winemaking techniques and aging of wine. Cold maceration. Governo all'uso toscano. Copigmentation. The production of barrels. Innovative additives for winemaking. Carbon dioxide: physical chemical properties. Fortified and flavored wines. Vermouth. Dessert wines. Production technology of selected fortified and dessert wines: Vernaccia di Oristano, Marsala, Porto, Madeira, Sherry, Tokaj and Sauternes and others. Wine spirits and brandy: classification. Distillation principles and practices. Characteristics of raw materials, fermentation, distillation and aging. Pomace fermentation. Grappa, Cognac, Armagnac, Whisky, Rhum, Tequila, Sakè and other distilled beverages. Liqueurs and bitters. Production technology of vinegar and aceto balsamico. Laboratory workshop on selected topics of wine analysis. Visit to wineries, scientific symposia and/or fairs on wine technology and equipment.

The part of enography includes the different characteristics and winemaking technologies of wines produced in different viticultural regions.

Nutrition physiology (6 credits IT)

The course will provide knowledge on the anatomy and physiology of the digestive tract, on the principles at the basis of the digestion and absorption of macronutrients and will discuss the function and quality of macro- and micronutrients, water, and alcohol. The course will also provide the basics of the nutritional quality of foods and define and provide insights on the concept of "food group". The "dietetics" part of the course will provide knowledge on energy requirements and energy balance between daily intake and energy expenditure. The program will then discuss the energy and nutrient needs of the population and scientific basis to estimate nutrient requirements and the recommended dietary allowances for the Italian population (LARN), the national Dietary Guidelines for the Italian population. Additional topics will be: food labelling, healthy dietary patterns, healthy and sustainable diet. A final focus will then be on the concepts of food allergy and food intolerance, with a basic explanation of the mechanisms underlying these phenomena and effective ways to face them from a nutritional standpoint.

Seminar: Cook the Mountain (7 credits DE)

seasonal programming of kitchen processes
 suppliers and products, a relationship to be built
 organisation of time and resources
 how to deal with food (vegetables, wild herbs, meat, cheese, cereals...)
 cutting techniques
 preservation methods (fermentation, drying, maturing...)
 cooking techniques (smoking, low temperatures...)
 use of tools
 case studies in sensory food analysis
 case studies of food chemistry and physics
 The values guiding the entire course are:
 To create a transversal research laboratory on gastronomy which investigates the values which, at a global level, unite culturally and socially the people who live the mountains as a resource, passion, challenge and heritage to be protected.
 To promote a new way of experiencing the relationship between cuisine and the mountains (on an international level) based on ethics and conviviality, environmental sustainability and territorial development.
 Promote mountain cuisine as a "catalyst for cultural processes", for the diffusion of a new model of sustainable development.

Food design and immersive food related experiences (6 credits DE)

Not only the food, but also the way in which it is consumed can be designed. The ingredients of a dish go far beyond its food content and extend to tradition, communication and culture. In "Food Design and immersive food related experience" the idea of food preparation will be broadened and the creation of a dish will be considered as a synesthetic project that includes all the phases from preparation to tasting, including also spaces and environments dedicated to them (from the tools to prepare or eat a food to the atmosphere of the places where it is consumed).

Terzo anno / Drittes Jahr
Profilo Enogastronomia - Profil Önologonomie

Food Quality Evaluation

Module 1: Sensory analysis and tasting techniques (6 credits EN)
 The course gives a general overview of scientific contents and is designed for acquiring professional skills and knowledge to develop projects related to sensory analysis and tasting of enogastronomy products. The list of topics include: fundamentals of sensory analysis, physiology of human senses, descriptive analysis, effects of processing on the sensory properties of enogastronomy products (food and wine). Development of procedures for defining a sensory profile. Construction of a profile sheet, theory and practical tests. Principles of selection and training of tasters, physiological and psychological errors.

Module 2: Chemical and physical analysis of food products (6 credits EN)

This course provides an in-depth study of the techniques used to evaluate the quality of food products. Students will explore the basic aspects of food analysis, including physical and chemical analysis methods. The course aims to provide students with knowledge and skills to ensure food safety, quality, and integrity.

Educational objectives:

- 1) Comprehensive Understanding: By the end of the course, students should have a comprehensive understanding of the concepts of food quality.
- 2) Practical Laboratory Skills: Students should develop skills in chemical and physical analysis applied for food quality.
- 3) The students can describe the main analysis needed for quality control and how to report the results of the analysis.

Management of food processes

Module 1: Management of Processes for Catering (6 credits IT)

The course aims to provide knowledge on the sizing criteria of facilities and equipment for collective catering and skills on the main regulations on the safety of facilities and equipment. It also aims to analyse the main logistical models used in the catering sector and to understand the principles governing sustainable development and sustainability along the food chain.

Students will have the ability to: recognize the different types of catering facilities; size the spaces, facilities and equipment needed to organize catering premises; assess the safety status of the equipment and the level of logistics present. They will also have skills to deal with issues related to waste reduction/management and to assess the sustainability of raw materials and menu formulations. Finally, they will be able to assess economic management, with reference to energy, facilities and operator safety, user welfare and environmental impact.

Module 2: Fluid thermodynamics for foods (3 credits IT)

The module provides the fundamentals of thermodynamics and heat transfer, with their physical quantities and fundamental relations, in order to understand energy systems for the food sector.

The study of prime movers based on direct cycles and inverse cycle will be proposed. The aim of the module is to provide a complete frame of the technologies devoted to energy production and refrigeration for food conservation. Other processes, as evaporation and drying will be presented with their applications.

Business organization (6 credits DE)

The course provides a general overview of the topics of Organization and Human Resource Management. The first part of the course will focus on the topics of Organization, the second part on the topics of Human Resource Management. Both topics are related to the praxis. Exercises, case studies, and student presentations enhance the learning of the topics.

Microbial Fermentations in Gastronomy (6 credits EN)

The course is aimed at acquiring professional skills and knowledge in the field of food fermentation, including precision fermentation and biotechnology. It aims to provide knowledge on the role of tailored microbial fermentation in imparting distinctive characteristics and flavors to food. In addition, the course provides basic concepts on the valorization of agro-food by-products through biotechnological processes, including fermentation and the use of food enzymes.

Protection of stored products

Module 1: Stored product pests (3 credits DE)

The course imparts basic knowledge in the field of protection of stored product protection. The list of topics include: Basics of healthy food production, Basics of plant protection, Biology of the most important storage pests on stored cereals, fruit and vegetables, Quantitative and qualitative effects of pest infestation, Monitoring and infestation detection, Preventive measures, Biological control methods, Chemical control methods

Module 2: Postharvest pathology (3 credits DE)

The module provides basic knowledge in the field of stored product protection focusing on postharvest pathology. An overview of the most important postharvest pathogens of fruit, vegetables and grain is provided, the principles of integrated control of postharvest diseases are introduced and different methodological approaches for the control of postharvest diseases are covered.

Specifically, the following topics will be addressed:

Introduction to postharvest pathology

Postharvest pathogens and diseases of selected crops

Mycotoxins

Introduction to integrated control of postharvest diseases

Physical methods for the control of postharvest diseases

Chemical methods for the control of postharvest diseases

Biological methods for the control of postharvest diseases

New technologies for improving host resistance

Recognising and diagnosing post-harvest pathogens and diseases (exercises in the laboratory)