

Description of the unit

Extension: natural sciences

Number of the unit	Title of the unit	Extent:
LCA	Food chemistry and analytics	11 ECTS
Competence acquisition	<p>The student has in-depth chemical knowledge about the structure of proteins, carbohydrates, fats, vitamins and minerals. He / she has an in-depth understanding of chemical mechanisms involved in food processing. The student knows the most important chemical components (secondary plant ingredients) in fruits, vegetables and spices and their influence on biochemical and molecular level. He / she can perform complex analyzes of food reaction products or metabolites in the food matrix or in body fluids. He / She knows the basics of the analysis of residues in food such as pesticides or herbicides. He / she knows the toxicological risks of food. He / she knows the most important groups of substances of toxic relevance. He / she knows the analysis of pollutants as well as their kinetics and metabolism in the organism.</p>	

Title of the course	Food chemistry and analytics I
Extent	6 ECTS
Course content	<p><u>Integrated course</u> Extension and processing current research results of chemistry on proteins, carbohydrates, fats, vitamins and minerals. (E.g., oligosaccharides and their synthesis, modification of proteins, plastein reaction, oxygen and its effects in the food matrix). Deepened understanding of the reaction mechanisms of previous classes of substances in food processing and their influence on nutritional physiology. Deepen the analytical methods for the determination of these substance classes and their metabolites in the food matrix or in body fluids. Expansion of the method spectrum in food analysis on GC-MS and HPLC-MS and special methods of analysis in food analysis. Current scientific research is particularly focused on scientific methods.</p> <p><u>Lab</u> Application of HPLC-MS, GC-MS, IC, ICP-OES and photometric methods to more complex tasks, characterization of ingredients, metabolites and contaminants in food and body fluids. Detection and tracking of residues in food raw materials or secondary products resulting from the processing of foods by means of suitable analytical methods. Specific methods of food analysis e.g. texture analyzer, rapid analysis IR, rheology, microscopy, migration tests</p>

Title of the course	Food chemistry and analytics II
Extent	2 ECTS
Course content	Essential ingredients of spices and aroma chemistry; fermentation chemistry and related by-products; chemistry of secondary plant compounds in fruit and vegetables and their effect on human health; alkaloids in coffee, tea and cocoa; extension of the chemistry of fats and edible oils; chemistry of milk, chemistry of flavor formations and analysis of flavorings; chemistry and analysis of residues in food from agricultural production; analysis of migration products; fast tests in the food industry.

Title of the course	Food toxicology
Extent	3 ECTS
Course content	Knowledge of the essential residues and contaminants in food; basis of the toxicological risk assessment; risk assessment approach; types and characteristics of effects; dose-effect correlation; toxicological examination methods; risk assessment concepts; determination of ADI value; new areas of food safety assessment (food supplements, fortified foods ...); analytical methods for the characterization of residues and contaminants, mycotoxins, prions, toxicological substances of food from toxicological point of view.

Extension: Dietetics

Number of the unit	Title of the unit	Extent:
ENL	Dietetics	10 ECTS
Competence acquisition	<p>The student has in-depth knowledge of the principles of the metabolism of nutrients and nutrient components and regulation of them.</p> <p>She / he acquires an expanded understanding of the basic mechanisms of bioavailability and substance transport and can apply this in the development of new foods.</p> <p>He / she can assess the influence of vitamins, minerals and trace elements (dietary elements) on the metabolism and evaluate them in the conception of food.</p> <p>He / she can assess nutritional physiology based on nutrient conception and biochemical pathways.</p> <p>He / She has an in-depth understanding of the nutrition of certain groups of people.</p> <p>She / he understands molecular mechanisms of regulation of the appetite and body weight as well as the energy metabolism.</p> <p>He / she knows the molecular mechanisms of receptors and signal transduction associated with carbohydrate, protein and fat metabolism.</p> <p>She / He recognizes the importance of genomics, proteomics and metabolomics in nutritional science.</p> <p>The student knows the influence of food on the gene regulation, furthermore he / she understands the connections between gene</p>	

	<p>variants and metabolic activities. He / she knows the practical methods of modern molecular biology in particular with nutritional sciences.</p>
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Title of the course	Dietetics and food biochemistry I
Extent	4 ECTS
Course content	<p>Extension and up-to-date research in the field of carbohydrate, fat and protein metabolism, their regulation, adaptation, interaction and disorders; depth research and current research in the field of fatty acids, amino acids and lipoprotein metabolism including cholesterol, its regulation and cholesterol related disorders; formation of bile acid and steroid hormones; biochemical processes in microorganisms in the food industry, determination methods of bioavailability; influencing the bioavailability of minerals, trace elements, vitamins and secondary plant compounds and transport systems in the cell membrane; specific requirements for nutrient requirements within the life cycle. Extension in the nutrition of certain groups of persons (e.g. shift workers); fasting and ketogenic diets; biochemistry of fasting, NO, CO and H₂S metabolism. Current research will be particularly focused on scientific methods.</p>

Title of the course	Dietetics and food biochemistry II
Extent	2 ECTS
Course content	<p>Further topics of signal transduction with a focus on regulation of carbohydrate, protein and fat metabolism; function of fatty tissue and adipokines, as well as peripheral and central mechanisms of appetite and body weight regulation by endocrine and neurological regulation mechanisms; phase I and phase II enzymes; biochemical and nutritional physiological function of plant ingredients; function of vitamins, minerals and trace elements in biochemical pathways and their importance in food; macronutrients in the regulation of the energy metabolism with a special emphasis on obesity development; central metabolic regulation on the transcription level, white and brown adipose tissues; new insights on brown adipose tissue of adults; circadian regulation of metabolism; nutrient density energy vs. energy density in food.</p>

Title of the course	Molecular nutrition
Extent	4 ECTS
Course content	<p>Lecture Basics of genomics, proteomics and metabolomics; methods that allow to study the effects of food on genetic level, on protein and metabolite levels; polymorphisms as determinants of nutritional diseases genetic variations and nutrient requirements; Genotyping and genome-wide association studies; interactions between food ingredients and genes; methods for determining the nutritional status of micronutrients and their metabolites; regulation of the antioxidative network, determination of antioxidant status, DNA methylation; cell models in molecular nutrition research; intestinal flora model systems and metabolite formation; molecular basis of nutrient-based guidelines.</p> <p>Lab Application of molecular biological methods for the characterization of the influence of food ingredients on the transcription of genes and expression of proteins (isolation of RNA from animal samples and mammalian cells, RT-PCR, Western blot, TIRF microscopy); DNA sequence analyzes, biochips, FACS analyzes, microscopy techniques.</p>

Extension: food technology

Number of the unit	Title of the unit	Extent:
LMA	Food equipment	6 ECTS
Competence acquisition	<p>The student knows the structures and the technical elements of food plants of important sectors of the industry. He / she is familiar with the performance and cost-determining process parameters as control and restrictions variables for effective plant operation. The student understands the complexity and influence of the product cycles. She / he is familiar with the development processes of machine technology and the requirements of optimal resource use. She / he can apply appropriate methods of optimization and conceptually combine the elements of material flow systems into complex and effective structures. The student knows the essential packaging materials and their properties. The student is able to evaluate the variety of materials (plastics, paper / cardboard, glasses, metals) which can be used in their suitability for the production of packaging. The student knows the features and functions of the packaging. The student knows the special characteristics of the filling technology of food. She / He can assign filling applications to typical application fields and knows the basics of hygienic design. The student is familiar with the components of aseptic filling</p>	

	<p>systems, the methods of packaging and plant sterilization. She / He is able to design special packaging systems suitable for the filling of foodstuffs.</p> <p>In addition, students are familiar with special methods of preservation as well as innovative packaging concepts, which extend the shelf life of food.</p> <p>The interplay of methods for preservation and special requirements for packaging is elaborated with the example of selected foods.</p>
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Title of the course	Food equipment and system optimization
Extent	3 ECTS
Course content	<p>Materials and construction elements of foodstuffs with taking into consideration a hygienic design, using the example of selected production processes from brewery, wine making, meat, sausage and fish manufacturing, dairy, bakery, confectionery production, fruit and vegetable processing. Main and secondary streams; sustainable energy management; food packaging machines (one-way and multi-path systems); simulation of operating behavior; process chains and their optimization; analysis of weak points and plant optimization (efficiency, availability, operating costs); specialization in HACCP on the example of allergy-relevant food ingredients.</p> <p>Case studies and computational exercises complete the lecture.</p>

Title of the course	Filling and packaging technology, storage and preservation
Extent	3 ECTS
Course content	<p>Minimal requirements for packaging materials and suitability for the food industry; important manufacturing processes for packaging industry, packaging materials and aids; properties of packaging materials; permeation and migration of plastics during storage; packaging functions and tasks (forms, filling, sealing); dosing technology and filling machines for careful filling of foodstuffs; dosing and filling of liquids, pasty goods and free-flowing dry goods; sterile and aseptic filling; upstream and downstream processes (blow molding, labeling, ...); disinfecting and decontamination; normative and legal framework for packaging, sales function, environmental function; storage and aging processes of food; cleaning and disinfection as the basis of operational hygiene and the basis for durable food; innovative methods for preservation e.g. Pulsed electric fields, electric pulse method; treatment with ionizing radiation; chemical preservatives; high pressure treatment; microwave treatment; modified atmosphere packaging.</p>

Number of the unit	Title of the unit	Extent:
LMV	Food process engineering	14 ECTS
Competence acquisition	<p>The student knows the effects of the treatment methods on nutrients, colors, aromas, texture, etc.</p> <p>The student extends basic understanding of the systematics of</p>	

	<p>mechanical process engineering and can independently solve more complex mechanical and process-technical problems in the food industry.</p> <p>The graduate has an in-depth knowledge of the most important mechanical processes in their theoretical foundations and their application to the food industry.</p> <p>The student is aware of the effects of using mechanical methods on nutrients, colors, aromas, texture, etc.</p> <p>The student is given an extended understanding of the systematics of thermal-process engineering and can apply the knowledge to independently solve more complex thermal-process-technical problems in the food industry.</p> <p>The student has an in-depth knowledge of the most important thermal processes in their theoretical foundations and their application to the food industry.</p> <p>The student can use the experimental planning in the development of processes.</p> <p>The student can apply statistical methods in the field of food sciences and in chemical-analytical questions.</p>
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Title of the course	Mechanical process engineering
Extent	6 ECTS
Course content	<p><u>Integrated course</u> Extension of knowledge and application orientated approach in the areas of dynamics of liquids; rheology of food; simple and complex disperse systems; separation of solid mixtures and solids (classification and sorting); separation of disperse systems (centrifugation, filtration); grinding of solids (grinding, crushing, cutting); combination of solids, liquids and gases (stirring, kneading, homogenizing, emulsifying, dry mixing); effect of the treatment methods on nutrients, color, flavor, texture, etc.; apparatus for carrying out these processes; application in cases from the food industry; micro-, nano- and ultrafiltration.</p> <p><u>Exercise</u> Computing exercises to the certain topics enrich the lectures, combined with lab exercises on the topics rheology, sieving, sighting, grinding.</p>

Title of the course	Thermic process engineering
Extent	6 ECTS
Course content	<p><u>Integrated course</u> Extension of knowledge and application orientated approach of heat technology: expansion by heat; heat transfer; dimensionless parameters, heat exchange; heat treatment by steam or water; consideration of qualitative aspects: blanching, pasteurization, heat sterilization, extrusion, evaporation and distillation; heat treatment by hot air: dehydration, baking and roasting; heat treatment with usage of oil; cooling, freezing and freeze-concentrating, freeze-drying. Drying and instantizing, effects of the individual processes on nutrients, color, taste, texture, etc., heat influence on protein denaturation and structuring. Heat inactivation of microorganisms.</p>

	<p>A prerequisite for the individual treatment procedures.</p> <p>Exercise Computing exercises to the certain topics enrich the lectures, combined with lab exercises on the topics of pasteurization, extrusion, distillation.</p>
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Title of the course	Statistics and design of experiments
Extent	2 ECTS
Course content	Introduction to the planning of technical-scientific experiments; Subfactorial experimental design (selection and experimental change of influencing variables); Requirement for statistical evaluability of data (sample sizes, number of groups, non-parametric and parametric statistical test methods); retrospective evaluation of results (distribution, variance, achievable significance as a function of test methods); significance corrections for multiple comparisons; solve specific tasks from the above contents in groups. The above aspects are used in particular in the optimization of production processes in the food industry or in the evaluation of nutritional studies or chemical-analytical questions.

Number of the unit	Title of the unit	Extent:
LMT	Food technology	17 ECTS
Competence acquisition	<p>The student receives an in-depth understanding of current issues in the food industry and critically questions technological and legal questions.</p> <p>The student understands interdisciplinary relationships in the food industry in particular between chemistry, nutrition and technology.</p> <p>The student has practical experience in the field of preservation, drying, extraction, membrane processes and distillation.</p> <p>He / she has an in-depth knowledge of fermentation processes, enzymes and microorganisms for the food industry.</p> <p>The student understands the importance of enzymes and enzyme immobilization for the food industry and can apply them.</p> <p>She / he can develop production processes using biotechnology.</p> <p>The student knows the classification systems for additives.</p> <p>The student knows the chemistry, application and effects of the most important additives.</p> <p>The student is aware of the approval criteria for additives.</p> <p>The student is aware of the declaration obligations and exceptions to the declaration obligation of additives.</p>	

Title of the course	Current topics in food technology I
Extent	5 ECTS
Course content	<p>Integrated course</p> <p>The course addresses to the current issues in food and beverage technology, e.g. national and international technological trends and future scenarios, the background of current media revisions,</p>

	<p>legal changes in the EU and their consequences for the technology at home and abroad. Examples of this would be:</p> <ul style="list-style-type: none"> - new raw materials and processes - technological possibilities and legal framework - consumer acceptance of new raw materials and processes - small-scale processing (e.g., microprocessing, 3D printing, urban factories) - sustainability, process optimization and valorization of by-products - innovation strategies, open innovation, consumer behavior and new technologies - modern aspects of in-process analysis and final product control <p>Lab Preservation; drying process; extraction.</p>
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Title of the course	Current topics in food technology II
Extent	4 ECTS
Course content	<p>Lecture The course addresses to current topics of food and beverage technology e.g. national and international technological trends and future scenarios; background of daily media coverage; legal changes in the EU and its consequences for the technology at home and abroad.</p> <p>Lab Membrane processes; distillation; baking process.</p>

Title of the course	Biotechnology of food
Extent	5 ECTS
Course content	<p>Lecture Extension of knowledge and application orientated approach in process kinetics of biological growth, enzyme kinetics, bioprocesses and bioreactors; types of food fermentations and structure and mode of operation of fermenters for food technology; effects of fermentation on food; regulation and control of enzyme production by microorganisms; use of gene technology for enzyme production; immobilization of enzymes; use of enzymes in the food industry; practical applications e.g. juice production, bread production, beer production, etc.; application of bioanalytics in the food industry.</p> <p>Exercise Basic exercises for fermentation: medium preparation, sterilization, kinetics of fermentation, measurement of process parameters, product isolation. Fermentation of yeast, production of starter cultures, usage of enzymes for the production of amino acids e.g. L-aspartic acid, usage of starter cultures and enzymes in the production of foods (e.g., yoghurt) or food basic materials (e.g., glucose syrup).</p>

Title of the course	Technology of additives
Extent	3 ECTS
Course content	Classification of the additives according to EU Regulation (EC), Codex Alimentarius and FDA; chemistry and application of the following additive groups: sweeteners, dyes, preservatives, antioxidants, carriers, acidifiers, release agents, fillers, emulsifiers, melting salts, production agents, flavor enhancers, foaming agents, gelling agents, coating agents, moisturizing agents, modified starches, packing gas, blowing agent, baking agents, complex builders, stabilizers, thickeners, flour treating agents. Labeling regulations for additives. Enzymes as additives, nanotechnology for additives.

Projects / Application

Number of the unit	Title of the unit	Extent:
PAM	Praxis oriented study unit	34 ECTS
Competence acquisition	<p>The graduate has experience in the processing of interdisciplinary technical questions of the professional field in the form of a field project or master thesis.</p> <p>He / she has experience in systematical analysis projects in the phases of problem analysis, problem solving, reporting and presentation.</p> <p>He / she has experience working on R&D projects.</p> <p>Projects with interdisciplinary content are encouraged.</p>	

Title of the course	Subject project/ Field Project
Extent	6 ECTS
Course content	<p>Practical implementation of the knowledge acquired in the different courses on an extended practical work in the professional field. Processing within the scope of an R&D project at University of applied sciences Wels or in an external company. Extensive independent processing of partial tasks by the students accompanied by the lecturer. Can be designed as a preliminary study for the master thesis.</p> <p>Project phases: analysis of the task; creating a project plan; processing the questions; preparing a report and presentation of the results. In particular, the students are advised that they have a free choice of topics. Furthermore, students are informed that they can also choose projects from their own research area. Projects with interdisciplinary content are being encouraged.</p>

Title of the course	Master thesis
Extent	26 ECTS
Course content	<p>Practical implementation of the knowledge gained in the various courses on a larger task of the professional field in the form of a master thesis.</p> <p>Project phases are: analysis of the task, survey of relevant technical literature, preparation of a project and experimental plan, processing of the questions, preparation of the master thesis and presentation of the results. In particular, the students are advised that they have a free choice of topics. Furthermore, students are informed that they can also choose projects from their own research area. Projects with interdisciplinary content are being encouraged.</p>

Title of the course	Master seminar
Extent	2 ECTS
Course content	<p>Accompanying the master's students in the handling of the question, the know-how input of the supervisor, the monitoring of the progress and the results. Assisting in the design of the master thesis with special consideration of scientific methods.</p>

Non-technical subjects

Number of the unit	Title of the unit	Extent:
SKR	Social skills and law	10 ECTS
Competence acquisition	<p>Exercises are usually held as blocks, in which the communication and leadership skills are preferably practiced on the basis of short introductory lectures by the lecturer, small group work, moderated plenum discussions, case studies, roll games, videos, film analyzes, individual and group feedback.</p> <p>The students are able to recognize cultural-specific phenomena of communication and thus to shape intercultural conversation situations and meetings accordingly.</p> <p>Students learn the basics of discussion and negotiating leadership and apply them successfully to study-specific topics.</p> <p>The students are able to apply the classical meeting moderation methods and the control of group processes in topics relevant to the course of studies.</p> <p>The students learn about the models, functions, tasks of managers and reflect the connection between leadership and personality.</p> <p>The students expand their knowledge in food law, in particular food safety and consumer protection legislation.</p> <p>The students extend their knowledge about regulations of "contaminants" and "pests" as well as self-control.</p>	

Title of the course	Intercultural communication
Extent	2 ECTS
Course content	Theories and core concepts of intercultural communication. Processes of intercultural adaptation (e.g., the step model of Milton Bennett). Culture specificity at international meetings and projects. Practice in negotiation and conflict resolution in the intercultural context. Development of intercultural key competences.

Title of the course	Negotiation and meeting moderation
Extent	2 ECTS
Course content	Harvard negotiation concept; forms of argumentation in negotiation management; efficient preparation and successful execution of a negotiation; Creation of results that satisfy both sides (win-win situations). Review and development of the current negotiating style; basics of moderation / discussion moderation; role, posture, tasks of moderator / meeting leader; preparation, execution, follow-up of a moderation / discussion; methods / tools of a moderation / discussion; intervention techniques for the control of group processes (target review, questioning technique, feedback techniques, visual discussion, ...).

Title of the course	Management
Extent	2 ECTS
Course content	Models, functions and tasks of management; key competencies of management; context of leadership and personality; role of leadership as the sum of all expectations of the role owner; leadership as a multiplier of a company's objectives and values; leadership as a developer of his own staff; influence on leadership (external and internal framework conditions); cooperative leadership; decision-making of employees; dealing with power and information.

Title of the course	Food law I
Extent	2 ECTS
Course content	Extension content of the food safety and consumer protection act; additives law; food labeling (obligatory, voluntary, health claims); specific provisions for food supplements; specific provision for dietary food; product right for food supplements or functional food. Many course contents are practiced and edited in the form of case studies.

Title of the course	Food law II
Extent	2 ECTS
Course content	Enrichment of food; novel food; regulations for the investigation of contaminants and pesticides; rules for company self-control; regulation for flavorings; protection of origin and specialties;

criminal Aspects, health hazards. Many course contents are practiced and edited in the form of case studies.

Number of the unit	Title of the unit	Extent:
ENG	English	4 ECTS
Competence acquisition	The course is organized as Exercise + examination. The curriculum is conducted on the basis of a series of topics, both written and spoken, preferably on realistic case studies and rolling games.	

Title of the course	English I
Extent	2 ECTS
Course content	<p>Advanced technical / scientific and business English: (Business) report writing, test report writing, documentation for the submission of new products / technologies / tools for research, research and development.</p> <p>Advanced general English: reading / discussion of topical and ethical issues.</p> <p>Proficiency level grammar and practice exercises.</p> <p>Advanced vocabulary and language in context.</p> <p>Focus on problem areas in language and style: e.g. phrasal verbs, register, inversion, emphasis, unreal tenses, text features ...</p>

Title of the course	English II
Extent	2 ECTS
Course content	<p>Reading and composition of technical/scientific papers, abstracts. Content: giving speeches, talks, public lectures on scientific/ engineering/ business subjects. Research papers: reading, understanding, writing. Advanced general English: reading/discussion of topical and ethical issues. Proficiency-level grammar and practice exercises. Advanced vocabulary and language in context. Focus on problem areas in language and style: e.g. phrasal verbs, register, inversion, emphasis, unreal tenses, text features...</p>

Optional group "Nutrition"

Number of the unit	Title of the unit	Extent:
ERN	Optional group "Nutrition"	14 ECTS
Competence acquisition	<p>He / she can independently solve practical biochemical problems. She / he can interpret relevant publications and recognize connections for her/ his own practical work.</p> <p>He / she can also independently create a work manual and optimize it with regard to a "standard operating procedure (SOP)".</p> <p>He / she can independently carry out biochemical lab operations (photometry, protein purification, enzyme activity determination and spectroscopy) on practical questions of the food industry.</p> <p>The student should know in detail the anatomical structure and the physiological function of the gastrointestinal tract, adipose tissue, muscle tissue, kidney, liver and blood.</p> <p>He / she is able to understand in detail the metabolic performance and the metabolic relations of certain tissues and organs at the physiological and molecular level.</p> <p>The student has basic knowledge about the performance physiology, sports physiology and the preventive effect of movement.</p> <p>The student knows the basic principles of pathophysiology and, in particular, the influence of food on disease-modifying conditions.</p> <p>He / She knows the basics of the central topics of public health.</p> <p>The student is familiar with meta-analyzes and biostatistics.</p> <p>She / he knows preventive measures for diet-related somatic diseases.</p> <p>She / he is aware of preventive measures to maintain health life-long.</p> <p>She / he can include questions from fields of application of the multidisciplinary public health sector so that specific concepts can be developed and evaluated.</p> <p>The student has an overview of the main topics and working methods of the science of the behavior opposite and experiencing food and drink and knows the research methods of the nutritional psychology.</p> <p>The student knows the psychological mechanisms that trigger hunger, thirst and appetite.</p> <p>He / She is well aware of the basic principles of human eating behavior and its impact on health.</p> <p>She / he knows models that influence nutritional behavior with regard to healthy nutrition.</p>	

Title of the course	Dietetics and food biochemistry
Extent	2 ECTS
Course content	<p>Application of biochemical lab operations to practical questions in the food industry and nutrition research. Methods such as preparative HPLC, chromatographic methods, microscopy and cell culture models.</p> <p>Practical basics of cell culture techniques, cytotoxicity studies on</p>

	cell culture models, isolation and characterization of enzymes (kinetics, inhibitor studies), immobilization of enzymes and their application in the food industry, e.g. lactase, Bioavailability on the Cell Model CaCo-2, fundamentals for nutritional physiologically relevant clinical studies, e.g. "Effect of food on the blood sugar level or beet juice on the nitrate / nitrite concentration in the saliva".
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Title of the course	Nutrition physiology and pathophysiology I
Extent	3 ECTS
Course content	Detailed and up-to-date research topics on the structure, morphology and metabolic performance of the gastrointestinal tract, adipose tissue, muscle tissue, kidney, blood and liver. Regulation of the metabolism of nutrients at the level of the organism; resorption of carbohydrates, proteins, fats, electrolytes, vitamins, secondary plant compounds in the individual organs: nutritional physiological assessment of food and functional food; nutritional therapies for common or significant diseases, including epidemiological data, pathophysiological mechanisms and therapeutic possibilities. Minimal diet, average needs and average dietary intake, dietary reference intake and maximal level, as well as the role of individual nutrients in the prevention of nutrition-related disorders.

Title of the course	Nutrition physiology and pathophysiology II
Extent	2 ECTS
Course content	Development of adipose tissue and functions of adipose tissue as an endocrine organ; muscle contraction and regeneration of the muscle; specifics of renal metabolism and excretion of metabolites and xenobiotics. Plasma level of minerals in the blood and their regulation; anabolic and catabolic processes in the liver; fundamentals of performance physiology; physical activity as a preventive factor; endurance capability and impact on the organism; pathophysiology of nutrition-related diseases; nutritional modulating effects on the immune system; influence of renal function on vitamin metabolism; significance of gastrointestinal microbionics on energy metabolism and immune function.

Title of the course	Public Health
Extent	3 ECTS
Course content	Central concepts and topics in public health, epidemiology, meta-analysis, biostatistics; environmental impacts on human health; current topics in the prevention of somatic disorders (obesity, diabetes, cancer ...); current topics in prevention in the course of life (infant age, adolescence, adult age, seniors); global health; evidence-based public health; prevention, crisis and risk management; endangering the public; recalls; influence of environmental conditions on risk potentials.

Title of the course	Nutrition physiology
Extent	4 ECTS
Course content	<p>Lecture: Fundamentals of nutritional psychology as a behavioral science of eating and drinking; psychology in the selection of food; sensory and genetic contributions to the selection behavior; psychological causes of eating and drinking disorders; eating behavior; food preferences; food and emotions; food ingredients and their impact on the psyche; vitamins, minerals and fatty acids and their contribution to mental health; nutritional knowledge in connection with psychological and psychological well-being; eating disorders such as bulimia and orthorexia.</p> <p>Lab: Food design, taking into account nutritional psychology, conducting surveys, regarding nutritional psychological success factors of products.</p>

Optional group "Technology"

Number of the unit	Title of the unit	Extent:
TEC	Optional group "Technology"	14 ECTS
Competence acquisition	<p>Students have basic knowledge in electrical engineering in the fields of DC and AC technology. She / he has an overview of the most important safety regulations.</p> <p>The students are familiar with the tasks of measurement technology, measured value evaluation and sensor technology with particular reference to the food industry.</p> <p>The students have knowledge of controller parameterization.</p> <p>The students are able to exchange ideas and information by means of technical drawing and to communicate with the outside world.</p> <p>The students are thoroughly familiar with the operation of a 3D development environment.</p> <p>The students are able to construct parametrically.</p> <p>The students are able to carry out contact and movement analyzes on the 3D model.</p>	

Title of the course	Electrical engineering
Extent	4 ECTS
Course content	<p>Lecture: Basic DC technology (electric current , voltage, power, resistance); Basic AC technology (capacitor, coil, current, voltage, power, rectifier, transformer, frequency converter); basics. Three-phase current (electric motors, generators); safety measures and regulations; basics of electrical measurement technology.</p> <p>Lab: Safety measures and regulations; exercises for DC technology (current, voltage, power, resistance); exercises for alternating</p>

	current technology (capacitor, coil, current, voltage, power, rectifier, transformer, frequency converter); exercises for three-phase current (electric motors, generators); exercises of the basics of electrical measurement technology.
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Title of the course	Metrology, regulation and control engineering I
Extent	4 ECTS
Course content	<p>Lecture: General definitions and tasks of measurement technology, basic concepts of measured value recording and measured value evaluation, sensor technology, selected, field-specific measuring principles, measuring methods, practical examples. In particular, the course addresses the needs of the food industry.</p> <p>Lab: Practical exercises in metrology, measurement and evaluation of measured values. Practical exercises with sensors and selected measuring principles and measuring methods related to the food sector.</p>

Title of the course	Metrology, regulation and control engineering II
Extent	4 ECTS
Course content	<p>Lecture: The meaning of control and regulation, basic structure of a control circuit, basic functionalities of the PID controller, important empirical procedures for controller parameterization. What is control technology compared to measuring and control technology, SPS vs. central process control systems, control system structures. In particular, the course addresses the needs of the food industry.</p> <p>Lab: Practical exercises to control circuits and PID controllers; practical exercises for controller parameterization and practical exercises on the field of food-related practical exercises for controller parameterization and control technology.</p>

Title of the course	CAD
Extent	2 ECTS
Course content	Interfaces of CAD / simulation and graphics programs, surface structures / free-form surfaces, assembly of individual parts, working with assemblies, import of external components / assemblies, simulation of movements, contact collision analysis, application of a 3D development environment to solve a more complex design task with project character. Pipelines, apparatus, installation drawings, castings and welding constructions, tolerances, R + I schemata. Special attention will be paid to the requirements of the food industry.