Food Safety and Quality Management – Course Descriptions (Summer Semester)

Food Biotechnology – 3 ECTS – Lectures, Laboratories

Food Biotechnology introduces students to the application of biological systems and biotechnological processes in food production and processing. The course covers the role of microorganisms, enzymes, and biotechnological methods in the manufacture of food products and ingredients. Students learn about fermentation processes, microbial cultures, enzyme technology, and selected modern biotechnological approaches used in the food industry. Laboratory classes provide practical experience in microbiological and biotechnological techniques relevant to food production. Emphasis is placed on the contribution of biotechnology to food quality, safety, sustainability, and innovation within the agri-food sector.

Teaching methods: lectures, laboratory experiments, microbiological and biotechnological analyses, practical exercises, and interpretation of experimental results related to food biotechnology.

Food Law – 2 ECTS – Lectures, Exercises

Food Law provides students with knowledge of the legal framework governing food production, distribution, and control within the European Union and international markets. The course covers principles of food legislation, responsibilities of food business operators, official control systems, food labeling requirements, consumer protection, and traceability. Students learn how legal regulations support food safety and fair trade practices throughout the food chain. Emphasis is placed on the interpretation and practical application of food law in food production and quality management systems.

Teaching methods: lectures, legal case studies, analysis of regulatory documents, group discussions, and practical exercises related to the application of food legislation in the food sector.

Quality Control Systems – 2 ECTS – Lectures, Exercises

Quality Control Systems introduces students to the principles, tools, and procedures used to ensure and maintain food quality and safety. The course covers quality assurance concepts, control methods, documentation systems, and selected quality management standards applied in the food industry. Students learn about inspection procedures, monitoring activities, corrective actions, and continuous improvement processes. Particular attention is given to the role of quality control systems in meeting legal requirements, customer

expectations, and industry standards. Emphasis is placed on practical approaches to quality management and the prevention of quality and safety deviations in food production.

Teaching methods: lectures, case studies, document analysis, group discussions, and practical exercises related to quality control procedures and quality management systems.

Food Microbiology – 4 ECTS – Lectures, Laboratories

Food Microbiology provides students with knowledge of microorganisms relevant to food production, preservation, quality, and safety. The course covers the characteristics of bacteria, yeasts, molds, and viruses associated with food, including both beneficial and harmful microorganisms. Students learn about microbial growth, factors influencing microbial contamination, food spoilage processes, and foodborne pathogens responsible for foodborne illnesses. Laboratory classes introduce microbiological methods used for the detection, identification, and enumeration of microorganisms in food products. Emphasis is placed on the role of microbiological control in ensuring food safety, product quality, and compliance with food regulations.

Teaching methods: lectures, laboratory experiments, microbiological analyses, interpretation of laboratory results, and practical exercises related to the detection and control of food microorganisms.

Automation in the Food Industry / Operation of Food Processing Equipment* – 4 ECTS – Lectures, Exercises, Laboratories

Automation in the Food Industry / Operation of Food Processing Equipment introduces students to modern technologies and equipment used in food production and processing. The course covers the principles of automation, process control systems, sensors, monitoring devices, and selected food processing machinery. Students learn about the operation, maintenance, and optimization of equipment used in various sectors of the food industry. Practical classes focus on the application of automated solutions and the assessment of technological processes in food production. Emphasis is placed on production efficiency, product quality, process safety, and the role of automation in modern food manufacturing.

Teaching methods: lectures, laboratory exercises, equipment demonstrations, practical activities involving food processing technologies, and analysis of automated production systems.

Food Authenticity / Food Fraud* – 4 ECTS – Lectures, Exercises, Laboratories

Food Authenticity / Food Fraud provides students with knowledge of food authenticity issues and fraudulent practices occurring within the food supply chain. The course covers the concepts of food authenticity, economically motivated adulteration, food fraud prevention, and methods used to verify product origin and composition. Students learn about common examples of food adulteration involving meat, dairy products, oils, honey,

spices, and other food products. Practical classes introduce analytical techniques and verification methods used to detect food fraud and confirm product authenticity. Emphasis is placed on consumer protection, traceability, regulatory requirements, and the role of authenticity assessment in ensuring confidence in food products.

Teaching methods: lectures, laboratory exercises, case studies, analysis of food fraud incidents, and practical activities related to food authenticity verification and adulteration detection.

* One of the listed alternative courses will be offered depending on the choice made by the regular student group in a given academic year.

Convenience and Functional Foods / Bioactive Food Components* – 4 ECTS – Lectures, Exercises, Laboratories

Convenience and Functional Foods / Bioactive Food Components introduces students to modern food products designed to meet consumer demands for convenience, health promotion, and improved nutritional value. The course covers the classification, production, and characteristics of convenience foods, functional foods, and foods enriched with biologically active compounds. Students learn about bioactive components such as dietary fiber, probiotics, prebiotics, polyphenols, antioxidants, vitamins, and other health-promoting substances. Practical classes focus on evaluating the composition, quality, and potential health benefits of selected food products. Emphasis is placed on the role of innovative food products in supporting consumer health, nutrition, and current market trends.

Teaching methods: lectures, laboratory exercises, case studies, product evaluation, and practical activities related to the assessment of functional foods and bioactive food components.

Food Additives in Food Quality Shaping / Functional Food Ingredients* – 4 ECTS – Lectures, Exercises, Laboratories

Food Additives in Food Quality Shaping / Functional Food Ingredients provides students with knowledge of substances used to improve the quality, stability, safety, and nutritional properties of food products. The course covers the classification, functions, and technological applications of food additives, including preservatives, antioxidants, colorants, emulsifiers, stabilizers, sweeteners, and flavor enhancers. Students also learn about functional food ingredients and their role in enhancing the nutritional and health-promoting value of foods. Practical classes focus on evaluating the effects of additives and functional ingredients on food quality and consumer acceptance. Emphasis is placed on technological effectiveness, safety assessment, regulatory requirements, and current trends in food formulation.

Teaching methods: lectures, laboratory exercises, case studies, analysis of food formulations, and practical activities related to the application and evaluation of food additives and functional ingredients.

Food Chemistry – 3 ECTS – Lectures, Exercises, Laboratories

Food Chemistry provides students with knowledge of the chemical composition, properties, and transformations of food constituents. The course covers the structure and functionality of proteins, carbohydrates, lipids, water, minerals, vitamins, and other compounds present in food. Students learn about chemical reactions occurring during food processing and storage, including oxidation, hydrolysis, Maillard reactions, and other processes affecting food quality and stability. Practical classes introduce analytical methods used to determine the chemical characteristics of food products and raw materials. Emphasis is placed on understanding the relationship between chemical composition, food quality, nutritional value, and food safety.

Teaching methods: lectures, laboratory analyses, calculation exercises, interpretation of analytical results, and practical activities related to the chemical evaluation of food products.