



**ROMANIA**  
**MINISTRY OF EDUCATION AND RESEARCH**  
**UNIVERSITY OF CRAIOVA**  
**FACULTY OF HORTICULTURE**



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**PACKAGE OF COURSES**  
**Bachelor study program: FOOD ENGINEERING**

This is the package of course of bachelor study program of Food Engineering from the University of Craiova / the Faculty of Horticulture / The Department of Horticulture and Food Science.

**FIELD: FOOD ENGINEERING**  
**PROGRAM TITLE: FOOD**  
**ENGINEERING**

**YEAR I, SEMESTER I**

**TITLE OF THE SUBJECT: SPECIAL MATHEMATICS**

**CODE:** D29IPAL101

**ECTS CREDITS:** 5

**TYPE OF DISCIPLINE:** Fundamental Discipline (DF)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge of the fundamental concepts of probability theory, the rules of probabilistic calculus, the main probability schemes, the notion of random variable. Knowledge of the main classical laws of distribution. Statistical analysis of the phenomenon. Graphical representation of a statistical series. Distribution of statistical data and graphical representation, synthesis of data with an indicator, determination of statistical indicators of populations and samples (e.g. indicators of variations and moments).

**COURSE CONTENT:** Basics of probability theory. Elements of mathematical statistics.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** verification (60%, 30% of tests, 10% active participation in seminars).

**TITLE OF THE SUBJECT: CHEMISTRY I**

**CODE:** D29IPAL102

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Fundamental discipline (FD)

**OBJECTIVES OF THE DISCIPLINE:** description of the general principles of determining the stability of chemical compounds; optimization and efficiency of the methods of analysis and control of the purity of raw materials, water, solvents, intermediate products, finished products, as well as their stability; description of the stages of validation of a chemical analysis method, evaluation of the performance parameters of an analytical method in order to validate it, application of validation tools, application of the documentation protocol of a validated method; identification of sources and components of uncertainty, calculation of measurement uncertainty and use of uncertainty information.

**COURSE CONTENT:** Notions of atom structure, chemical bonds, main classes of inorganic compounds, bases, salts, oxides, titrimetry by proton exchange reactions, titration curves, applications of acid-base titrimetry, titrimetry by redox reactions, applications of redox titrimetry, titrimetry by complexation reactions, titrimetry by precipitation reactions.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** exam (answer to questions 70%, verification of laboratory works 30%).

**TITLE OF THE DISCIPLINE: PHYSICAL AND COLLOIDAL CHEMISTRY I**

**CODE:** D29IPAL103

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Fundamental discipline (FD)

**OBJECTIVES OF THE DISCIPLINE:** Understanding and operating with basic notions of colloidal chemistry and chemical thermodynamics; To deepen the fundamental notions regarding the principles of chemical thermodynamics and their applications in the study of physical and chemical processes; Understanding the thermodynamic properties corresponding to chemical reactions and other physical and chemical processes; Understanding the notions of chemical equilibrium, interphase equilibrium and operating with specific thermodynamic quantities; Understanding the mechanical, optical and electrical properties of colloids and their applications; Understanding surface phenomena and applications; Conducting experiments, rigorously applying methods of analysis and interpretation of results, observing safety norms and laboratory work techniques; Developing IT skills with applications in physical chemistry: processing and interpreting experimental data.

**COURSE CONTENT**

1. CHEMICAL THERMODYNAMICS: Introduction. Thermodynamic system. Parameters and status functions. Equations of state. Thermodynamic processes; Balance. Partial molar properties. The zero law of thermodynamics; The first law of thermodynamics. The exchange of energy between the system and the environment. Internal energy. Enthalpy. Thermal capacities. Applications of the first law to energy exchange processes without phase transformations: isobaric processes, isotherm, adiabatic and polytropic transformations, the Jules-Thomson effect; The second law of thermodynamics. The Carnot cycle, entropy, spontaneity of natural processes; Absolute temperature. Thermodynamic potentials. Free energy. Free enthalpy. Applications of Principle II of Thermodynamics; The third law of thermodynamics. Heat theorem. Plank's postulate. Absolute entropy of substances; Physical equilibrium. Equilibrium criteria. Homogeneous system, heterogeneous system, phase, independent component, degrees of freedom, fundamental equilibrium equation. The Law of Phase. Clausius Clapeyron's equation; Solutions. Ideal Solutions, Real Solutions, Vapour Pressure, Raoult's Law; 2. CHEMISTRY OF COLLOIDS: Introduction. The object and importance of the study of colloidal chemistry. Colloidal systems. Obtaining and purifying colloidal systems; Kinetic-molecular and optical properties. Sedimentary, Stokes formula. Sedimentation in centrifugal field. Brownian motion. The Tyndall phenomenon. Light diffusion in colloidal systems; General superficial phenomena. The free energy of the surface layer. Humidity phenomena. Membrane potential; Adsorption phenomena. The adsorption coefficient. The surface tension of solutions, the Gibbs equation. the Siskovsky equation, the traube-Duclaux rule; Electrocapillary and electrokinetic phenomena. Electroosmosis.

Electrophoresis; Ultramicroheterogeneous systems, emulsions, gels. Soli. Types of emulsion, emulsion formation. Association colloids. Gels; *Experimental work:* Specific rules and regulations for carrying out experimental work in the physico-chemistry laboratory; Graphical representation of experimental data;

Determination of the neutralization heat of a strong acid with a strong base; Determination of the equilibrium constant  $K_c$  for the esterification reaction of acetic acid with ethyl alcohol; Preparation and purification of colloidal systems; Determination of the viscosity of agar-agar solution; Association colloids: determination of critical micellar concentration;

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (written and oral exam, 70% exam, 20% experimental papers, 10% projects).

<b>TITLE OF THE COURSE: APPLIED INFORMATICS</b>
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**CODE:** D29IPAL104

**ECTS CREDITS:** 5

**TYPE OF DISCIPLINE:** Fundamental discipline (FD)

**OBJECTIVES OF THE DISCIPLINE:** using computer tools to solve problems in the field of specialization; making documents in a form as appropriate as possible for the purpose for which they were created; approaching, on different levels of complexity, the computerized processing of text, through examples; computer modeling of engineering processes; exemplifying the diversity of fields in which Word can be used and processing and interpreting data with Excel spreadsheets.

**COURSE CONTENT** Windows operating systems: overview; applications running in the Windows environment; utilities; Windows Explorer. Microsoft WORD: Create/save/open/close file. Page setting: page margins, page sizes, page orientation, header and footer options; Print Preview view. Move/copy/paste; text selection; search and replace, move in the document. View document; Create header and footer, ruler, toolbars. Insert into file: page numbers; page/section breaks; footnote; insert drawing, diagram, object, text box. Text formatting – specifying all formatting attributes. Creation of numbered/bulleted/hierarchical lists; application of borders and shadows. Formatting text in columns, specifying tab positions and guide characters. Insert table, work with tables. Creating drawings: Drawing toolbar; inserting equations into the document. Microsoft EXCEL: Excel Work Environment. Types of data; entering and editing data. Formatting spreadsheets. Working with data: sorting; querying/filtering; Link creation. Working with formulas. Use of functions: time and date functions; mathematical functions; statistical functions; financial functions. Creating and editing diagrams: the Wizard application for creating diagrams; types of charts; Editing and formatting diagrams. Data analysis: pivot tables; scenarios/variants.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** exam

<b>TITLE OF THE SUBJECT: LINEAR ALGEBRA, ANALYTIC AND DIFFERENTIAL GEOMETRY</b>
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**CODE:** D29IPAL105

**CREDITS:** 5

**TYPE OF DISCIPLINE:** Fundamental discipline (FD)

**OBJECTIVES OF THE DISCIPLINE:** Development of the understanding of the concepts of linear algebra,

analytic and differential geometry. Training the ability to apply mathematical methods for solving problems in engineering, physics and related fields. Providing tools for analytical reasoning and rigorous mathematical proofs.

**COURSE CONTENT:** Linear Algebra: Vectors, vector spaces, linear independence, base, dimension, linear transformations, matrices, determinants, eigenvalues and vectors, diagonalization.

Analytical geometry: Cartesian coordinate systems, lines, planes, conic sections, distances and angles in space, intersections and projections.

Differential geometry: Curves and surfaces, parametric representations, tangent vectors, curvature and torsion of curves, fundamental forms I and II, applications in physics and engineering problems.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Verification (answers to the colloquium 80%, Seminar/practical papers: 20%).

<b>TITLE OF THE DISCIPLINE: ELEMENTS OF MECHANICAL ENGINEERING I</b>
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**CODE:** D29IPAL106

**ECTS CREDITS:** 5

**TYPE OF DISCIPLINE:** Fundamental discipline (FD)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge of concepts, theories and methods in the field of mechanics and materials. Understanding the technological issues required for the operation of general engineering processes in food industry equipment. Application of the basic principles and methods of mechanical engineering (specific to the disciplines of mechanics and material strength) to improve knowledge on functional and constructive problems specific to equipment in the food industry.

**COURSE CONTENT:** Mechanics - Introduction: Classification of Macroscopic Mechanical Bodies; Mechanical divisions; Principles of mechanics. Static: Free material point; Center of gravity; Friction laws; Technical applications of statics. Kinematics: Trajectory, speed, acceleration; Angular velocity and acceleration; Particular movements of a material point; Rectilinear movement of the material point; Rotational movement of the rigid body; Analysis of the movement of the gear with straight teeth. Dynamics: Mechanical work, energy and power; kinostatics of cylindrical gear mechanisms with straight teeth.

Strength of materials - Tensile: External and internal forces; Reaction forces; Simple and complex requests; Unit voltage; Deformations and displacements; The relationship between tensile stresses and deformations; Real and conventional characteristic curve; Hooke's Law. Bending: Straight bar effort charts; Definition of bending forces in the straight bar section; The Convention of Signs; Relationships between bent straight bar efforts; Analytical stress charts for straight bars; Dimensional sizing for bent bars; Bent bar deformations. Torque: Calculation of torque; Unit stresses and deformations in the circular bar; Torsion for thin-walled tubular bars.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Verification (answers to colloquium 50%; final answers to periodic laboratory tests 40%; laboratory notebook 10%).

## YEAR I, SEMESTER II

### **TITLE OF THE SUBJECT: ORGANIC CHEMISTRY**

**CODE:** D29IPAL209

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Fundamental discipline (FD)

**OBJECTIVES OF THE DISCIPLINE:** To acquire the fundamental notions of organic chemistry; Explanation and understanding of the principles and phenomena that govern the synthesis and reactivity of organic compounds.

**COURSE CONTENT:** Introductory notions about organic chemistry. Types of formulas in organic chemistry. Chemical bonding. Isomerism in organic chemistry. The main types of reactions in organic chemistry. Cyclic and acyclic saturated hydrocarbons. Double-bonded unsaturated hydrocarbons. Triple-bonded unsaturated hydrocarbons. Aromatic hydrocarbons. Halogenated compounds. Hydroxyl compounds: alcohols and phenols. Organic nitrogen compounds. Carbonyl compounds. Carboxylic acids and derivatives. Saccharides. Amino acids.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** verification (answers to colloquium 60%, final answers to practical papers 40%).

### **TITLE OF THE SUBJECT: CHEMISTRY II**

**CODE:** D29IPAL210

**ECTS CREDITS:** 5

**TYPE OF DISCIPLINE:** Fundamental discipline (FD)

**OBJECTIVES OF THE DISCIPLINE:** The discipline aims to learn the methods of synthesis and the physico-chemical properties of hydrocarbons and organic compounds with simple functions.

**COURSE CONTENT:** Nomenclature of organic compounds. Hybridization of atomic orbitals. Isomerism of organic compounds. Saturated hydrocarbons. Alkanes and cycloalkanes. Methods of obtaining. Physical and chemical properties. Importance of alkanes and cycloalkanes. Unsaturated hydrocarbons. Alkene. Alkene. Methods of obtaining. Physical and chemical properties. The importance of alkenes and alkenes. Unsaturated hydrocarbons. Alkyne. Methods of obtaining. Physical and chemical properties. The importance of alkynes. Aromatic hydrocarbons. Methods of obtaining. Physical and chemical properties. The importance of aromatic hydrocarbons. Halogenated compounds. Methods of obtaining. Physical and chemical properties. The importance of halogenated compounds. Hydroxyl compounds. Alcohols. Methods of obtaining. Chemical properties. Representatives. Phenols. Methods of obtaining. Physical and chemical properties. Representatives. Carbonyl compounds. Methods of obtaining. Physical and chemical properties. The importance of aldehydes and ketones. Carboxylic acids and their functional derivatives. 9.1. Carboxylic acids. Methods of obtaining. Physical and chemical properties. Representatives. Functional derivatives of carboxylic acids: esters, amides, nitriles, acid chlorides, acid anhydrides. Obtaining and properties. Organic nitrogen compounds. Nitroderivatives. Amine

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** exam (answer to questions 70%, verification of laboratory works 30%).

### **TITLE OF THE DISCIPLINE: GENERAL MICROBIOLOGY**

**CODE:** D29IPAL211

**ECTS CREDITS:** 5

**TYPE OF SUBJECT:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge of the microflora important for the food industry.

**COURSE CONTENT:** Description of the main genera and species of microorganisms important for the food industry. Knowledge of isolation and identification techniques that can be applied to microbial germs present in food. Knowing the parameters that could influence the activity of microorganisms that are present in food. Knowledge of the microorganisms involved in the technology of obtaining food products.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (answers to the exam 80%, final answers to practical work carried out in the laboratory: 20%).

### **TITLE OF THE DISCIPLINE: PHYSICAL AND COLLOIDAL CHEMISTRY II**

**CODE:** D29IPAL212

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Fundamental discipline (FD)

**OBJECTIVES OF THE DISCIPLINE:** To acquire the fundamentals of chemical kinetics and electrochemistry; Correlation of kinetic and electrochemical parameters; Development of practical skills and teamwork skills in the physical chemistry laboratory; To interpret experimental data.

**COURSE CONTENT:** Introduction; Kinetics of simple and complex reactions; Gas-phase reaction mechanism. Chain reactions; Enzymatic kinetics; Phenomena of imbalance in electrolyte solutions; Electrochemistry, thermodynamics; Operation of the electrochemical system: electrolysis and batteries.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** exam (final exam 70%, evaluation of practical work 30%).

### **TITLE OF THE DISCIPLINE: ELEMENTS OF MECHANICAL ENGINEERING II**

**CODE:** D29TPAL213

**ECTS CREDITS:** 5

**TYPE OF DISCIPLINE:** Fundamental discipline (FD)

**OBJECTIVES OF THE DISCIPLINE:** To apply the basic principles and methods of mechanical engineering (specific to the discipline Elements of Mechanical Engineering) to improve the knowledge regarding the functional and constructive aspects necessary for the operation of general engineering processes in the equipment of the food industry. Knowledge of the principles of sizing and verification of mechanical assemblies and mechanical transmission components specific to equipment in the food industry.

**COURSE CONTENT:** Taking into account dimensional accuracy and shape of constituent parts in

mechanical transmissions: Tolerances and adjustments; Surface roughness. Non-removable assemblies: Welded joints; Riveted joints; Demountable Assemblies: Threaded; Nuts; Feathers. Friction transmission: Belt transmission; V-belt transmission geometry; V-belt drive calculation. Cylindrical Gear Transmission: Classification; Materials used for the manufacture of gears; Geometry of cylindrical gears; Basic relationships for cylindrical gears; The Basic Law of Cylindrical Gears; The profile of the teeth; Damage to gears; Cylindrical gears with straight/inclined teeth. Forces in cylindrical gears with straight/inclined teeth. Axles and shafts: General; Materials; Calculation of shaft strength. Bearings: Classification; Bearing materials; Sliding bearings; Roller bearings; Symbolization of bearings; Dynamic load capacity; Equivalent dynamic load.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (answers to the exam 50%; final answers to periodic laboratory tests 30%; laboratory notebook and project notebook 20%).

#### **TITLE OF THE SUBJECT: PHYSICS**

**CODE:** D29IPAL214

**ECTS ECTS CREDITS:** 5

**TYPE OF DISCIPLINE:** Fundamental discipline (FD)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge of the notions, concepts, laws and principles specific to physics with implications in the phenomena that determine the living structure of food and its safety. Understanding the physical methods of monitoring, the physical techniques of investigation and exploration of the living. Knowledge of physical activity in food technology assessment. Deepen knowledge of physics-specific terms for phenomena and laws that determine the properties and characteristics of food. Knowledge of field-specific applications and recording and research equipment of importance in physics and applied to food science. The discipline aims to explain phenomena, processes, applications and apparatus according to the main physical parameters, the characteristics of food. Students must explain the involvement of each physical process in the structure and stability of food (from atomic to macro level) or interpret the evolution of the food system based on the evolution of characteristic factors.

**COURSE CONTENT:** Introduction to environmental physics. The structure of matter and their organization. Quantum Physics. Spectroscopy elements. Solar spectrum. The interaction of radiation with matter. Molecule, states of aggregation. Molecular Biophysics. Phenomena of contact between liquid and solid. Molecular transport phenomena. Diffusion and osmosis. Water and its role. Introduction to biological thermodynamics. Radiant energy, characteristics of thermal energy.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (answers to the exam 60%, periodic answers to practical works 10%, results to periodic control works 30%).

#### **TITLE OF THE SUBJECT: MODERN LANGUAGE I**

**CODE:** D29IPA107

**ECTS ECTS CREDITS:** 2

**TYPE OF DISCIPLINE:** Complementary discipline (CD)

**OBJECTIVES OF the DISCIPLINE:** To improve the ability to understand the spoken English language and the specific texts of the vocabulary written in English; a reference material specially designed for the students of the Faculty of Horticulture, TPPA Specialization, but also for those who want to learn ESP vocabulary in context; Practice vocabulary and TPPA grammar practice, address four skills, reading, listening, speaking and writing, explaining specific vocabulary, and grammar lessons that are thought out in detail, with exercises that provide students with useful practice in this particular area. True or false exercises, filling in gaps, matching words to their definition, translations, in-context dialogues, and bold keyword lessons are really selected for students to understand and use correctly; Deepening the main grammatical rules of the English language in a modern, problematic way, requiring students to learn, but also to think; Strengthening the skills of dialogue, description, reporting; Emphasizing the practical nature of learning, the course is intended to stimulate students' interest in written and spoken language, improve knowledge and communication in English.

**COURSE CONTENT:** Focus on language: Simple/continuous present tense; Vocabulary: Sterilization – refers to any process that effectively kills or removes transmissible agents (such as fungi, bacteria, viruses, spore forms, etc.) from a surface, equipment, food item, or medicine or biological culture medium. Sterilization; It can be achieved by applying heat, chemicals, irradiation, high pressure or filtration. Focus on Language: Simple Past/Continuous Past; Vocabulary: Canned – Food preservation: Fungi and environmental bacteria are used in the preparation of fermented and pickled foods, such as leavened bread, alcoholic beverages, cheese, pickles, and yogurt. Many cultures eat seaweed, a protist, or blue-green algae (cyanobacteria) such as spirulina. Additionally, salt is often consumed as a flavoring or preservative, and baking soda is used in food preparation. Both are inorganic substances, as is water, an important part of the human diet; Focus on language: Present Perfect Simple/Continuous; Vocabulary: Mushrooms - Cultured foods: The human use of mushrooms for food preparation or preservation and other purposes is extensive and has a long history: yeasts are needed for the fermentation of beer, wine and bread, other fungal species are used in the production of soy sauce and tempeh. Mushroom cultivation and mushroom picking are large industries in many countries. Many fungi are antibiotic producers, including  $\beta$ -lactam antibiotics such as penicillin and cephalosporin. The widespread use of these antibiotics for the treatment of bacterial diseases such as tuberculosis, syphilis, leprosy, and more began in the early 20th century and continues to play a major role in antibacterial chemotherapy. The study of the historical uses and sociological impact of mushrooms is known as ethnomycology; Bacteria, often

*Lactobacillus* in combination with yeasts and molds, have been used for thousands of years in the preparation of fermented foods such as cheese, pickles, soy sauce, sauerkraut, vinegar, wine, and yogurt. The ability of bacteria to degrade a variety of organic compounds is remarkable and has been used in waste processing and bioremediation. Bacteria capable of digesting hydrocarbons in petroleum are often used to clean up oil spills.

**LANGUAGE OF INSTRUCTION:** English

**ASSESSMENT METHOD(S):** Verification (answers to exams 80%, theoretical and practical tests 20%).

**TITLE OF THE SUBJECT: MODERN LANGUAGE II**

**CODE:** D29TPAL215

**ECTS CREDITS:** 2

**TYPE OF DISCIPLINE:** Complementary discipline (CD)

**OBJECTIVES of the DISCIPLINE:** To improve the ability to understand the spoken French language and the specific texts of the vocabulary written in French, using a reference material specially designed for the students of the Faculty of Horticulture, Landscape Specialization, but also for those who want to learn vocabulary in context. Practice landscape vocabulary and grammar practice, address four skills, reading, listening, speaking and writing, explain specific vocabulary and grammar lessons that are thought out in detail, with exercises that provide students with useful practice in this particular area. True or false exercises, filling in gaps, matching words to their definition, translations, in-context dialogues, and bold keyword lessons are really selected for students to understand and use correctly. Deepening the main grammatical rules of the French language in a modern, problematic way, requiring students to learn, but also to think.

Strengthening the skills of dialogue, description, reporting, Emphasizing the practical nature of learning, the course aims to stimulate students' interest in written and spoken language, in order to improve knowledge and communication in French.

**COURSE CONTENT:** Focus on language, Vocabulary: Landscape. Scale and heterogeneity (incorporating composition, structure and function). Patch and mosaic. Border and edge. Ecotones, ecotones and ecotopes. Disruption and fragmentation. Theory. Application. Research directions.

**LANGUAGE OF INSTRUCTION:** French

**ASSESSMENT METHOD(S):** Verification (exam answers 80%, theoretical and practical verification 20%).

**TITLE OF THE SUBJECT: PHYSICAL EDUCATION**

**CODE:** D29IPAL108

**ECTS CREDITS:** 3

**TYPE OF DISCIPLINE:** Complementary discipline (CD)

**OBJECTIVES OF THE DISCIPLINE:** The course aims to form theoretical, practical and methodical skills for the individual or group practice of a healthy lifestyle; to raise students' awareness of the role and importance of

practicing physical exercise; to develop the physical, mental and social skills of students.

**COURSE CONTENT:** Athletics: main elements of long jump and speed running; Applicative routes combined with treadmills; Applicative routes combined with jumping elements; Applied routes combined with balance, climbing, climbing, etc.; Sports games: volleyball, football, basketball; Bilateral games in similar competition conditions.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Evaluation by practical tests 80%, continuous evaluation during the semester 20%

**TITLE OF THE SUBJECT: PHYSICAL EDUCATION**

**CODE:** D29IPAL216

**ECTS CREDITS:** 3

**TYPE OF DISCIPLINE:** Complementary discipline (CD)

**OBJECTIVES OF THE DISCIPLINE:** The discipline aims to form theoretical, practical and methodical skills for the individual or group practice of a healthy lifestyle; to make students aware of the role and importance of practicing physical exercise; to develop the physical, mental and social skills of students.

**COURSE CONTENT:** Athletics: main elements of long jump and speed running; Applicative routes combined with treadmills; Applicative routes combined with jumping elements; Applied routes combined with balance, climbing, climbing, etc.; Sports games: volleyball, football, basketball; Bilateral games in similar competition conditions.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Evaluation by practical tests 80%, continuous evaluation during the semester 20%

**YEAR II, SEMESTER I**

**TITLE OF THE SUBJECT: FOOD CHEMISTRY**

**CODE:** D29IPAL317

**CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** To acquire basic knowledge of food science and nutritional, functional characteristics of the food product. Knowledge of processes and procedures regarding food composition, quality, food safety, standards and hygiene. Acquisition of basic notions and practical skills necessary for the evaluation of the organoleptic and physico-chemical properties of raw materials and food products and for determining the nutritional value (nutritional and energy) of food products.

**COURSE CONTENT** Food and nutrient. Water in food. Minerals as nutrients. Carbohydrates in food; Chemical modification of carbohydrates, thermal degradation, caramelization. Properties of starch and pectic substances. Dietary fiber. Lipids in food; hydrolysis, oxidative degradation and thermal degradation. Properties of amino acids and proteins. Maillard's

reaction, Strecker's reaction. The nutritional value of proteins. Power components with regulating and sensory action. Organic acids. Food oxidation processes. Food changes during processing and storage

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (answers to the exam 60%, continuous evaluation of laboratory works 20%, elaboration and presentation of laboratory portfolio 20%).

**TITLE OF THE DISCIPLINE: SPECIAL MICROBIOLOGY**

**CODE:** D29IPAL318

**ECTS CREDITS:** 5

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** to know the genera and species of microorganisms involved in the technology of obtaining food, as well as those that can degrade food.

**COURSE CONTENT:** description of the main genera and species of microorganisms responsible for obtaining food, its degradation or which can cause food poisoning. The study of the factors that influence the microorganisms present in food.

**LANGUAGE OF INSTRUCTION:** ROMANIAN

**ASSESSMENT METHOD(S):** Exam (answers to the exam 80%, final answers on practical work carried out in the laboratory 20%).

**TITLE OF THE DISCIPLINE: VEGETABLE RAW MATERIALS I**

**CODE:** D29IPAL319

**CREDITS:** 3

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge of the main directions of grape production and the characteristics of fruit trees, classification of trees in temperate climates and the importance of these aspects for the use of fruits in the preservation and processing process; Presentation of the morphological and technological characteristics of the main table grape varieties, seedless varieties and wine grape varieties; Presentation of the physical, sensory and chemical composition of the fruit raw materials with a role in determining the processing direction; Presentation of the characteristics of the raw materials of the main tree species.

**COURSE CONTENT:** Explanation and interpretation of the main technological indices that characterize grape varieties; Explanation and interpretation of the main quality parameters of grapes as raw material for winemaking during the ripening process; Determination of the main qualitative parameters of table grapes, apricots and wine grapes; Definition of the principles of methods of evaluating the quality of fruit trees; Evaluation of the olfactory-gustatory possibilities and quality of fruit trees using specific methods and techniques.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (exam 60%, practical workshops 40%).

**TITLE OF THE COURSE: UNITARY OPERATIONS IN THE FOOD INDUSTRY I**

**CODE:** D29IPAL320

**ECTS CREDITS:** 5

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** To understand the fundamental notions and parameters specific to the processes of separation of heterogeneous systems, mixing of materials and concentration by evaporation, separation by crystallization, pasteurization and sterilization. Analysis of factors influencing the efficiency of separation processes. Explanation of the construction and functional principles for the main types of heterogeneous system separation apparatus, evaporators, mixers, crystallization equipment, pasteurization and sterilization apparatus.

**COURSE CONTENT:** Separation of heterogeneous systems by sedimentation, centrifugal filtration: fundamental aspects, calculation of characteristic dimensions, constructive and functional principle of the main types of machines. Evaporation: definitions, influencing factors, mass balance, thermal balance, variants of evaporation operation, evaporators. Pasteurization and sterilization: definition, influencing factors,

pasteurization and sterilization machines and plants specific to food process technology. Crystallization: solid-liquid equilibrium, nuclear, crystallization variants.

**LANGUAGE OF INSTRUCTION:** ROMANIAN

**ASSESSMENT METHOD(S):** Exam (exam answers 80%, final answers to laboratory papers 20%).

**TITLE OF THE COURSE: GENERAL TECHNOLOGIES IN THE FOOD INDUSTRY I**

**CODE:** D29IPAL321

**ECTS CREDITS:** 5

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge of the general principles, methods and procedures involved in different sectors of the food industry; Proper use of technological methods and procedures in various branches of the food industry: vinegar industry; the wine industry, the meat and meat preparation industry; milk industry as well as drinking water used in the food industry

**COURSE CONTENT:** The course addresses the role of water in the food industry, highlighting the importance of water quality and treatment at all stages of production. The processes specific to the wine industry are then studied, where the fermentation and stabilization of the products are analyzed. It also deals with the vinegar industry, with a focus on the biological and technological processes of obtaining it. Another part is dedicated to the meat and meat products industry, where slaughtering, processing and preservation operations are studied, as well as the milk and dairy industry, which targets pasteurization, fermentation and cheese production technologies. It also explains the different technological processes (alcoholic fermentation, acetic fermentation) from a theoretical and practical point of view; determination in the laboratory of the main quality

parameters of the studied food products; determination of organoleptic properties by tasting the finished product; identifying possibilities for market recognition of food products that do not comply with current standards  
**LANGUAGE OF INSTRUCTION:** Romanian  
**EXAMINATION METHOD:** exam (course evaluation 70%, continuous evaluation 30%)

**TITLE OF THE COURSE: HYGIENE OF COMPANIES IN THE FOOD INDUSTRY**

**CODE:** D29IPAL322

**ECTS CREDITS:** 3

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** To prepare future engineers who are committed to specializing in the field of the food industry in terms of the hygiene rules specific to food establishments, as well as to know and deepen the modern methods and techniques through which the hygiene of personnel, equipment, installations and devices that are used in the field of the food industry can be ensured.

**COURSE CONTENT:** Sanitation and hygiene requirements regarding the design and construction of food industry units. Functional requirements in ensuring sanitation and hygiene. Sanitation techniques concerning foodstuffs. Methods and means of hygiene used in the food industry. Hygiene procedures that relate to water used in the food industry. Hygiene of food unit staff.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Verification (answers to colloquium 75%, answers to practical work carried out in the laboratory 25%).

**TITLE OF THE COURSE: GLOBAL FOOD SECURITY POLICIES AND STRATEGIES**

**Code:** D29IPAL323

**Credits:** 3

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** To develop knowledge and skills on food security at national and international level. Understanding the determinants of food security and the measures needed to ensure it. Knowledge of applicable international policies, strategies and standards in the field of food safety and security. Training skills in the analysis and implementation of food safety procedures, including HACCP and product traceability.

**COURSE CONTENT:** Food Security: Determinants, Concepts and Measures. National and international bodies with responsibilities in ensuring food security. European Policies on Food Security: The acquis communautaire. Codex Alimentarius. The White Paper on Food Safety. Nutrition security policies. The impact of access to food on food security. Intervention. The effects of technology adoption and the effects of the head of household gender on food security. Concepts on food security, food safety and well-being. Romania's Food Safety and Security Strategy. Food safety management. HACCP – Principles used in the risk analysis system and critical control points. Implementation of food safety procedures. Food safety: food quality, food standards,

traceability, ensuring and guaranteeing food safety. International standards and food safety requirements/

**Language of instruction:** Romanian

**ASSESSMENT METHOD(S):** verification (colloquium responses 80%, seminar/practical papers: 20%)

**TITLE OF THE COURSE: ELEMENTS OF ELECTRICAL ENGINEERING**

**CODE:** D29 IPAL324

**ECTS CREDITS:** 3

**TYPE OF DISCIPLINE:** Fundamental discipline (FD)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge of notions about electrical and magnetic phenomena: electrostatics; stationary electricity; magnetic field of electric current; electromagnetic induction; alternating current; electric cars.

**COURSE CONTENTS:** Electric Field Strength; Electric Potential; Insulated Conductor in Electrostatic Field, Capacitor Capacitance; Capacitor Grouping, Electric Current in Metal Conductors; Laws of Electrical Circuits; Electrical Energy and Power; Magnetic Field, Magnetic Flux, Law of Electromagnetic Induction, AC Circuits, Electric Machines: Electrical Transformer; DC machine; the synchronous machine; induction machine; electric actuators.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** verificare (exam answers 80%, final answers to laboratory work 20%).

**YEAR II, SEMESTER II**

**TITLE OF THE DISCIPLINE: PRINCIPLES OF HUMAN NUTRITION**

**CODE:** D29IPAL427

**ECTS CREDITS:** 3

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVE OF THE DISCIPLINE:** To know the energy needs of man, the factors that influence him, as well as how to determine the nutritional and energy value of food; Knowledge of the role of proteins, carbohydrates and lipids in human nutrition, the needs of these nutrients and their food sources; Knowledge of concepts related to the nutritional value of food and the role of different food groups to ensure a correct diet

**COURSE CONTENT:** Energy metabolism ; Protein and amino acid metabolism; Lipid metabolism; The beneficial action of unsaturated fatty acids; Digestion and carbohydrate metabolism; Dietary fiber; Vitamins; Biomineral compounds; Microelements in human nutrition; Water in the human body; Nutritional characteristics of the main food groups; The influence of technological processes on the nutritional value of food; Eating behavior.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** verification (colloquium answers 60%, seminar activity 25%; regular testing 15%).

**TITLE OF THE DISCIPLINE: BIOCHEMISTRY****CODE:** D29IPAL428**ECTS CREDITS:** 3**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** The discipline Biochemistry provides students with information on the main concepts, theories and methods of structural and functional characterization of biological molecules, in an interdisciplinary context. Solving specific requirements by identifying and using notions and concepts specific to biochemistry. Applying the principles and methods of biochemistry to solving a specific problem and identifying possible conclusions. Obtaining and correctly interpreting experimental data on a biological process, phenomenon or structure, using methods, techniques and equipment specific to biochemistry.

**COURSE CONTENT:** Cellular organization and chemical composition of living matter. General characteristics of biomolecules. Amino acids, structure, classification, general physical properties, amphoteric character, types of chemical reactions. Protein and non-protein amino acids, biochemical roles. Proteins, classification (simple, conjugated), protein structure levels (primary, secondary, tertiary and quaternary structure), polypeptide chain folding. Carbohydrates. Oses and their derivatives – structure, isomery, physical and chemical properties, more important representatives (pentoses, hexoses, carbohydrate acids and alcohols, amino carbohydrates, deoxyglycoses) and their biological roles. Oligo-carbohydrates, structure, properties, biological roles. Homogeneous polycarbonates (starch, glycogen, cellulose) and heterogeneous (glycosaminoglycans, pectic substances) – structure, properties, biological roles. Lipids. Saturated and unsaturated fatty acids. Lipids with glycerol-triacylglycerols and glycerophospholipids- structural characteristics and biochemical roles. Lipids that do not contain glycerol - sphingolipids, waxes, terpenes, steroids - structure, properties and biochemical roles. Nucleotides and nucleic acids. Structure and functions of nucleotides. Primary structure of DNA and RNA, physical and chemical properties. DNA replication, repair, recombination. The biological roles of RNA. Transcription and translation of the genetic message. Methods and techniques for analyzing and manipulating genetic material. Introduction to metabolism. Energy aspects, coupling of endergonic and exergonic processes, the role of ATP. The metabolic importance of enzymes and vitamins. Catabolism – general characterization. Cellular respiration- glycolysis, citric acid cycle, oxidative phosphorylation. Anabolism. Photosynthesis - light reactions. Dark reactions.

**LANGUAGE OF INSTRUCTION:** Romanian**ASSESSMENT METHOD(S):** Exam (written exam 80%, laboratory colloquium 20%).**TITLE OF THE COURSE: COMPUTER-AIDED GRAPHICS****CODE:** D29IPAL429**ECT CRETITE:** 3**TYPE OF DISCIPLINE:** Fundamental discipline (FD)**OBJECTIVES OF THE DISCIPLINE:** The general

objective of the course is to develop the necessary skills for students to use computer-aided graphics tools and techniques. The course aims to familiarize students with 2D and 3D modeling methods, technical drawing and graphic representation standards, thus contributing to their preparation for integration into the food industry and the use of digital solutions in design and innovation.

**COURSE CONTENT:** Introduction to computer-aided graphics. Advanced drawing and editing tools for technical and creative representations. Three-dimensional modeling and optimization of graphic objects in technical and visual design. Add and edit graphic details. Digital image processing, rendering and technical illustration for professional documentation. Graphic composition and technical illustration. Vector graphics and visual composition in technical illustration. Editing and optimizing images for documentation and presentation. Practical exercises in 2D drawing and editing in CAD/CANVA systems. Creating and simulating a 3D model from a 2D drawing. Integration of digital graphics into applied projects.

**LANGUAGE OF INSTRUCTION:** Romanian**ASSESSMENT METHOD(S):** Verification & Project (answers to verification 30%, final graphic design project 50%, presence/involvement during the course 20%).**TITLE OF THE DISCIPLINE: CONSUMER BEHAVIOR****CODE:** D29IPAL430**ECTS CREDITS:** 3**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** To learn the knowledge regarding the consumer's behavior necessary for the marketing of food products, respectively to highlight the main concerns in the field of marketing, the subfield of consumer behavior that a specialist involved in the processing and marketing of food products must have

**COURSE CONTENT:** Factors influencing consumer behavior; The purchasing decision-making process; Factors influencing consumer behavior. Need; Factors influencing consumer behavior. Motivation. Theories of motivation. Motivational principles; Factors influencing consumer behavior. Perception. Learning/Experience. Personality; Factors influencing consumer behavior. Socio-cultural influences. The influence of groups. The influence of the family. Socio-cultural influences. The influence of culture. The influence of social class; Factors influencing consumer behavior. Situational factors; Factors influencing consumer behavior inside stores; Consumers and the services market. Organizational consumer; New trends in consumer behavior; Considerations regarding the main manipulation techniques used in order to pre-terminate consumer behavior; Measuring the consumer satisfaction fence; The influence of the brand on consumer behavior

**LANGUAGE OF INSTRUCTION:** Romanian**EXAMINATION METHOD:** Exam (Course evaluation 70%, continuous evaluation 30%)

**TITLE OF THE COURSE: UNITARY OPERATIONS IN THE FOOD INDUSTRY II**

**CODE:** D29IPAL431

**ECTS CREDITS:** 3

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**DISCIPLINE OBJECTIVES:** To approach and understand the laws of interphase mass transfer and the separation principles for homogeneous mixtures by absorption, distillation, rectification and extraction. Knowledge of the basics and specific parameters for the drying process of food products. Analysis of the factors and parameters influencing the specific mechanisms and efficiency of separation in the processes of absorption, extraction, distillation, rectification and drying. Explanation of the constructive and functional principles for absorption columns, grinding columns, solid-liquid extractors and the main types of dryers.

**COURSE CONTENT:** Absorption: fundamentals. Distillation-rectification: vapor-liquid equilibrium, simple distillation, calculation of rectification operation, azeotropic rectification, vapor entrainment. Grinding columns. Liquid-solid extraction. Drying: general, convective, conductive, spray and freeze-drying aspects and the main types of dryers.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (exam answers 80%, final answers to laboratory papers 20%).

**TITLE OF THE COURSE: GENERAL TECHNOLOGIES IN THE FOOD INDUSTRY II**

**CODE:** D29IPAL432

**ECTS CREDITS:** 3

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** To understand the general principles, methods and procedures involved in different sectors of the food industry. Proper use of technological methods and procedures in various branches of the food industry: ethyl alcohol industry, natural distilled beverages industry, sugar and sugar products industry, and oil industry.

**COURSE CONTENT:** The course examines the specific processes of the ethyl alcohol and natural distilled beverage industries, with a focus on alcoholic fermentation, distillation, and product stabilization. The vinegar industry is also addressed, emphasizing biological and technological production processes. In addition, the course includes knowledge related to the oil industry, from the extraction and refining of vegetable fats, as well as the sugar industry, focused on beet processing and the purification of sugary juices. Finally, the fruit juice industry is analyzed, studying the technological process of obtaining juices. By combining theoretical and practical aspects, the course develops essential skills for understanding and optimizing technological processes in the food industry.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (written/oral): 70%; Continuous evaluation (during the semester): 30%.

**TITLE OF THE COURSE: VEGETABLE RAW MATERIALS II**

**CODE:** D29IPAL433

**CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge of the object of study, general aspects of vegetable raw materials, cereals and technical plants related to production, harvesting and exploitation technology, general trends of use and their classification according to the criteria of origin and use;

Knowledge of plant raw materials (vegetables, cereals and technical plants) as vegetative and generative anatomical-morphological parts of plants, their nutritional value and the elements that define their quality.

**COURSE CONTENT:** Knowledge of the importance of crop plants in the supply of plant raw materials in the plant raw material processing industry, current trends in the production and use of plant raw materials. Structure of plant production. Classification of plant raw materials according to certain criteria (technological, organisms, perishability and use). The physical properties of plant raw materials and their importance in technological practice. Plant raw materials represented by metamorphosed roots, tubers, bulbs, fruits (nightshades, cucurbitaceous), cereals, oil, legumes (for beans and pods), aromatic plants and spices.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Verification (exam answers 60%, regular practical testing during the semester 40%).

**TITLE OF THE DISCIPLINE: ETHICS AND ACADEMIC INTEGRITY**

**CODE:** D29IPAL434

**ECTS CREDITS:** 2

**COURSE TYPE:** Complementary discipline (CD)

**OBJECTIVES OF THE DISCIPLINE:** To familiarize with professional ethical and deontological problems, concepts and aspects. To provide the knowledge and skills necessary for a research activity in accordance with the requirements of university ethics and deontology. Acquisition of knowledge for the elaboration of scientific communications.

**COURSE CONTENT:** Principles and values of academic ethical conduct. Academic responsibilities and rights. Documentation techniques, identification of sources. Forms of citation of sources. Communication of research results. Plagiarism, forms, ways of identification. Other forms of lack of academic integrity and ethics. The consequences of lack of ethics and academic integrity.

**LANGUAGE OF INSTRUCTION:** Romanian.

**ASSESSMENT METHOD(S):** 100% colloquium responses

**TITLE OF THE SUBJECT: MODERN LANGUAGE I****CODE:** D29IPAL325**ECTS CREDITS:** 2**TYPE OF DISCIPLINE:** Complementary discipline (CD)

**OBJECTIVES OF THE DISCIPLINE:** To improve the ability to understand spoken English and texts specific to vocabulary written in English; a reference material specially designed for the students of the Faculty of Horticulture, TPPA Specialization, but also for those who want to learn ESP vocabulary in context; Practice vocabulary and TPPA grammar practice, address four skills, reading, listening, speaking and writing, explaining specific vocabulary, and grammar lessons that are thought out in detail, with exercises that provide students with useful practice in this particular area. True or false exercises, filling in gaps, matching words to their definition, translations, in-context dialogues, and bold keyword lessons are really selected for students to understand and use correctly; Deepening the main grammatical rules of the English language in a modern, problematic way, requiring students to learn, but also to think; Strengthening the skills of dialogue, description, reporting; Emphasizing the practical nature of learning, the course is intended to stimulate students' interest in written and spoken language, improve knowledge and communication in English.

**COURSE CONTENT:** Focus on Language: Means of Expressing the Future Vocabulary: Meat: The meat packaging industry is an industry that deals with the slaughter, processing, and distribution of animals such as cattle, pigs, sheep, and other animals. The industry focuses primarily on the production of meat for human consumption, but also produces a variety of by-products, including hides, feathers, dried blood, and, through the melting process, fats such as tallow and protein flour such as meat and bone meal; Focus on language: Plural of nouns I Vocabulary: Pasteurization is a process that slows down microbial growth in food. The process was named after its creator, French chemist and microbiologist Louis Pasteur. The first pasteurization test was completed by Louis Pasteur and Claude Bernard on April 20, 1862. Unlike sterilization, pasteurization is not meant to kill all

pathogenic microorganisms in food or liquids. Instead, pasteurization aims to reduce the number of viable pathogens so that they are unlikely to cause disease (assuming the pasteurization product is refrigerated and consumed before the expiration date). Commercial-scale sterilization of food is not common, as it negatively affects the taste and quality of the product; Focus on language: Plural of nouns II Vocabulary: Food irradiation is the process of exposing food to ionizing radiation to destroy microorganisms, bacteria, viruses, or insects that could be present in food. Other applications include inhibiting germs, delaying maturation, increasing juice yield, and improving rehydration. Irradiation is a more general term for the deliberate exposure of materials to radiation in order to achieve a technical objective (in this context "ionizing radiation" is involved). As such, it is also used on non-food items such as medical plastics, gas pipe tubing, underfloor heating hoses, shrink films for

food packaging, auto parts, wires and cables (insulation), tires, and even gemstones. Compared to the amount of irradiated food, the volume of these everyday applications is huge, but it is not noticed by the consumer. **LANGUAGE OF INSTRUCTION:** English **ASSESSMENT METHOD(S):** Verification (answers to exams 80%, theoretical and practical tests 20%).

**TITLE OF THE SUBJECT: MODERN LANGUAGE II****CODE:** D29IPA435**ECTS CREDITS:** 2**TYPE OF DISCIPLINE:** Complementary discipline (CD)

**OBJECTIVES OF THE DISCIPLINE:** To improve the ability to understand the spoken French language and the texts specific to the vocabulary written in French; to use a reference material specially designed for the students of the Faculty of Horticulture, Horticulture Specialization, but also for those who want to learn vocabulary in context. Practicing important horticultural vocabulary and grammar practice, address four skills, reading, listening, speaking and writing, explain specific vocabulary and grammar lessons that are thought out in detail, with exercises that provide students with useful practice in this particular area. True or false exercises, filling in gaps, matching words to their definition, translations, in-context dialogues, and bold keyword lessons are really selected for students to understand and use correctly. Deepening the main grammatical rules of the French language in a modern, problematic way, requiring students to learn, but also to think. Strengthening the skills of dialogue, description, reporting. Emphasizing the practical nature of learning, the course aims to stimulate students' interest in written and spoken language, in order to improve knowledge and communication in French.

**COURSE CONTENT:** Organism-centered topological ecology. Analysis of social-ecological systems using natural and social sciences and humanities. Ecology guided by the cultural meanings of worldly landscapes of life.

**LANGUAGE OF INSTRUCTION:** French**ASSESSMENT METHOD(S):** Verification (exam answers 80%, theoretical and practical checks 20%).**TITLE OF THE DISCIPLINE: FIELD PRACTICE****CODE:** D29IPAL436**ECTS CREDITS:** 4**COURSE TYPE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** The purpose of the practical training is to develop skills and abilities appropriate to activities specific to the food sector.

**COURSE CONTENT:** Rules of conduct and occupational safety techniques in specialized laboratories. Work organization, first aid measures, PCI rules. Introduction to laboratory activity (containers, utensils and laboratory equipment); Signing of occupational safety forms.

Special Microbiology

Non-specific food microbiota. Characteristics of contaminating microorganisms, conditions of action,

effects. Microorganisms that cause food spoilage. The role of enzymes in food spoilage. Toxicogenic microorganisms (molds and bacteria). Microorganisms that cause food infections. Pathogenic microorganisms (viruses, pathogenic bacteria, phytopathogenic fungi). Other microorganisms and products of microbial metabolism that induce biological risk. Modern principles applied in the microbiological control of food. Methods for assessing the number of microorganisms (classical methods and rapid methods). Microorganisms that are indicators of the microbiological quality of food. Microorganisms that are indicators of food safety.

Hygiene in food companies

-Hygiene control before the start of the production process, during the production process and at the end of the production process (visit to food industry units). - Control of washing and disinfection solutions in food industry units (laboratory). Microbiological standards for hygiene assessment. Hygiene standards for the maintenance of sanitary facilities, technological spaces and for the continuous health education of staff in agri-food markets (visit). Examination of wastewater in the food industry. Water treatment, water chlorination, water disinfection (visit to food industry units). (the activities are carried out in the laboratories of the Faculty of Horticulture/production or research units/economic agents whose field of activity is compatible and relevant for the trainee student's specialization)

Vegetable raw materials I

Grain legumes: general information, biological characteristics. Importance, chemical composition, biology, ecology, ecological zones, cultivation areas. Oilseeds: general information, common biological characteristics. Sunflower. Importance, chemical composition, systematics and varieties, biology, ecology, cultivation areas. Oilseed flax, rapeseed, castor oil, sesame; Tuber and root crops: General information, common biological characteristics. Potatoes and sugar beets. Importance, distribution, systematics and varieties, biology, ecology, cultivation areas.

General Technologies in the Food Industry I/ II

Determination of ethyl alcohol content in fermented alcoholic beverages. Beer analysis (technical quality conditions, determination of total acidity, determination of color, determination of carbon dioxide and sensory analysis of beer). The activities are carried out in the laboratories of the Faculty of Horticulture/production or research units/economic agents that have a compatible and relevant field of activity for the trainee student's specialization.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam 80%; periodic practical tests during the semester 20%.

**TITLE OF THE SUBJECT: PHYSICAL EDUCATION**

**CODE:** D29IPAL326

**ECTS CREDITS:** 3

**DISCIPLINE REGIME:** Complementary discipline (CD)

**OBJECTIVES OF THE DISCIPLINE:** The discipline aims to form theoretical, practical and methodical skills for the individual or group practice of a healthy lifestyle;

to make students aware of the role and importance of practicing physical exercise; to develop the physical, mental and social skills of students.

**COURSE CONTENT:** Gymnastics: Exercises with the front and elastic band; Aerobic Gymnastics/Fitness; Applicative routes combined with treadmills; Applicative routes combined with balance exercises, climbing, climbing; Sports games: volleyball, football, basketball; Bilateral games in similar competition conditions.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Evaluation by practical tests 80%, continuous evaluation during the semester 20%

**TITLE OF THE SUBJECT: PHYSICAL EDUCATION**

**CODE:** D29IPAL437

**ECTS CREDITS:** 3

**DISCIPLINE REGIME:** Complementary discipline (CD)

**OBJECTIVES OF THE DISCIPLINE:** The discipline aims to form theoretical, practical and methodical skills for the individual or group practice of a healthy lifestyle; to make students aware of the role and importance of practicing physical exercise; to develop the physical, mental and social skills of students.

**COURSE CONTENT:** Athletics: Long jump technique; Utilitarian-applicative skills; Exercises for the development of general strength; Exercises for speed development; Exercises for the development of coordination capacity; Sports games: handball, table tennis; Bilateral games in similar competition conditions.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Evaluation by practical tests 80%, continuous evaluation during the semester 20%

**YEAR III, SEMESTER I**

**TITLE OF THE COURSE: MACHINERY IN THE FOOD INDUSTRY I**

**CODE:** D29IPAL538

**CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge of the principles and methods of mechanical engineering for understanding the construction and technological problems specific to equipment in the food industry. The principles of operation and knowledge of the most representative equipment in the food industry. Design principles, knowledge and application of specific constructive and functional/technological sizing for equipment in the food industry.

**COURSE CONTENT:** The action of food and non-food products on materials: Considerations regarding the different types of corrosion. Metal materials recommended for food packaging and equipment manufacturing for the food industry: General purpose steels; Alloy steels; Alloys of non-ferrous materials. Plastics recommended for food packaging and equipment manufacturing for the food industry: Classification;

Physicochemical and technological characteristics. Metal containers for the food industry equipment: thin/thick-walled containers; cylindrical containers subjected to the action of internal pressure (constructive/functional description of the representative equipment); constructive/technological design. Equipment for the transport of solid bulk materials: characteristics of bulk materials; types of action of the conveyors (constructive/functional description of the representative equipment); constructive/technological design. Equipment for conveying and processing liquids: Centrifugal pumps; Axial pumps; Positive displacement pump; Vacuum pumps (constructive/functional description of the representative equipment); Constructive/technological design. Equipment for conveying and processing compressible liquids: Compressors; Fans (constructive/functional description of the representative equipment); Constructive/technological design. Buildings and installations for water supply: Water supply scheme; Ground/surface water supply; Washing/cleaning equipment: medium/large washing machines (constructive/functional description of the representative equipment); estimation of utility consumption; constructive/technological design. Dosing and packaging equipment: solids/liquid/paste dosing equipment; bottle removal/loading equipment; labelling equipment (constructive/functional description of the representative equipment).

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (answers to colloquium 50%; final answers to periodic laboratory tests 40%; laboratory notebook 10%).

#### **TITLE OF THE COURSE: FOOD SAFETY**

**CODE:** D29IPAL539

**CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge and understanding of the relationship between the presence of contaminants in different food products of animal and/or plant origin, understanding the chain of contamination and decontamination; understanding the methods and techniques of assessing food safety during processing and storage, up to the consumer; AML for various food contaminants; understanding of decontamination mechanisms (GMP, GAP); acquiring knowledge on: classification and general characterisation of safety factors in different food matrices; risk analysis; knowledge of the chemical and microbiological characteristics of the main food safety factors.

**COURSE CONTENT:** General notions; natural contaminants affecting food safety; effect of chemical contaminants on safety; effect of processing on food safety; contamination of food with fungal toxins; microbiological contamination with viruses, protozoa and parasites of food; effect of food additives.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** exam (exam answers 60%, laboratory activity 25%; periodic testing 15%)

#### **TITLE OF THE DISCIPLINE: LEGISLATION IN THE FOOD INDUSTRY**

**CODE:** D29IPAL540

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** The discipline aims to form fundamental knowledge regarding the legal framework that regulates the production, processing, packaging, labeling and marketing of food products.

**COURSE CONTENT:** The course presents the main national and European normative acts related to food safety, consumer protection, product traceability and quality standards. The responsibilities of operators in the food sector are analyzed, as well as the role of sanitary-veterinary and food safety control and inspection institutions. The discipline also focuses on food hygiene legislation, additives, contaminants, geographical indications and certification of organic products. By studying this subject, students acquire skills in the correct interpretation and application of legal provisions, necessary to ensure the compliance of technological processes and protect public health. In addition, legal documentation and analysis skills are developed, essential for professional activity in the food industry, where compliance with the legislation is an essential condition for quality, transparency and competitiveness.

**LANGUAGE OF INSTRUCTION:** Romanian

**EXAMINATION METHOD:** verification (course evaluation 60%, continuous evaluation 40%)

#### **TITLE OF THE DISCIPLINE: TECHNOLOGY OF WINE, VINEGAR AND DISTILLED BEVERAGES I**

**CODE:** D29IPAL541

**ECTS CREDITS:** 5

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge of the technological processes involved in obtaining wine, vinegar and distilled beverages, from grape processing to the finished product. Understanding the main chemical, physico-chemical and biochemical phenomena that occur during the fermentation of the must and its transformation into wine.

Identification and determination of the main constituents of must and wine, as well as knowledge of the basic technological principles for obtaining vinegar and distilled beverages.

**COURSE CONTENT:** The discipline provides students with fundamental knowledge of technological processes in the wine and fermented beverage industry. Topics such as the classification of wines and products derived from grapes, the chemical and biochemical composition of must, the microflora specific to the wine industry, the role of antiseptic and antioxidant substances, as well as the stages of alcoholic fermentation are addressed. The basic technological principles for obtaining vinegar and distilled beverages are also presented, highlighting the biochemical transformations and distillation processes involved. Practical activities include physicochemical and microbiological determinations on musts and wines, using modern methods of analysis and quality control.

**LANGUAGE OF INSTRUCTION:** Romanian

**EXAMINATION METHOD:** exam (oral evaluation 20%, written/oral evaluation 60%, continuous oral laboratory evaluation 20%)

**TITLE OF THE COURSE: PRINCIPLES AND METHODS OF FOOD PRESERVATION**

**CODE:** D29IPAL542

**ECTS CREDITS:** 5

**TYPE OF COURSE:** Specialized discipline (SD)

**COURSE OBJECTIVE(S):** Knowledge of the scientific bases of the conservation processes: refrigeration, freezing, modified atmosphere packaging, thermal treatment, pickling, marinating, preservation with antiseptics, preservation by reducing water activity (concentration, dehydration, salting, preservation with sugar addition). Knowledge of product transformations during preservation processes, influence of preservation processes on food quality. Quality control of food products subject to preservation processes.

**COURSE CONTENTS:** Food spoilage. Classification of the preservation methods. Refrigeration. Freezing. Modified atmosphere packaging. Thermal treatment. Pickling. Marinating. Preservation with antiseptics. Preservation by reducing water activity: concentration, dehydration, preservation with sugar and salting.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (answers to exam 60%, laboratory activity 20%; laboratory regular testing 20%).

**TITLE OF THE DISCIPLINE: VEGETABLE AND FRUIT PROCESSING TECHNOLOGY I**

**CODE:** D29IPAL543

**ECTS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** aims to familiarize students with the technologies and operations necessary for preserving plant products in a fresh state. The course covers both theoretical and practical aspects related to the physical and chemical properties of vegetables and fruits, as well as the technological flows for their storage and preservation under optimal conditions. Essential operations such as harvesting, conditioning, packaging, pre-cooling, and storage are discussed, along with the use of different spaces and means to maintain the quality and hygiene of these products. The program ensures the development of skills in analysis and quality control, utilizing specific analytical methods to guarantee food safety and compliance with European and national regulations. Through this discipline, students are adequately prepared for roles in the food industry, particularly in quality control and research, contributing to the production and supply of safe, high-quality food products.

**COURSE CONTENTS:** Properties of agricultural products, including chemical, physical, and sensory characteristics: This encompasses the analysis of the compositional elements, physical attributes such as texture, weight, and appearance, as well as sensory qualities like taste, aroma, and color that define the quality and freshness of the products.

Primary biochemical processes occurring after harvest: After harvesting, agricultural products undergo various biochemical changes such as respiration, enzymatic activities, fermentation, and microbial spoilage. These processes can lead to deterioration, ripening, or alterations in flavor, texture, and nutritional value if not properly managed.

Transformation of agricultural products as a result of alteration processes: Post-harvest, products may experience changes including enzymatic browning, moisture loss, sugar fermentation, or other chemical modifications. These transformations can affect the shelf life, safety, and quality of the produce.

Description of the technological flow for fresh storage of agricultural raw materials: This involves outlining the step-by-step procedures and technological processes used to preserve fresh agricultural raw materials, including initial cleaning, sorting, cooling, packaging, and storage conditions such as temperature and humidity control, aimed at maintaining quality during storage.

Understanding the main types and methods of agricultural product storage: Knowledge of various storage methods—including cold storage, controlled atmospheres, refrigeration, and dry storage—is essential. This also covers the selection of storage types based on the product's nature, intended shelf life, and economic considerations, to minimize losses and maintain product quality.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (answers to exam 70%, final answers to Laboratory works 30%).

**TITLE OF THE COURSE: ADDITIVES AND INGREDIENTS IN THE FOOD INDUSTRY**

**CODE:** D29IPAL544

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge and use of additives in the food industry, Conditions for the use of food additives, International regulations on the areas of use and maximum allowed doses for food additives

**COURSE CONTENT:** The importance and necessity of the use of additives in the food industry, national and international regulations on the areas of use and maximum allowed doses for food additives, The role of additives, ingredients and technological auxiliaries in improving the quality of food products, Classification of food additives and adjuvants, Preservatives and antioxidants, Sealants, stabilization, buffering, hardening and sintering, Water Retention Agents, Clarifying and Stabilizing Agents, Foaming Agents, Baking Agents, Dough Conditioners, Baker's Yeast, Enzymes, Flavors, Flavors and Flavor Enhancers, Food Colorings, Acid Sweeteners, Sweeteners, Emulsifiers, Texturizing Agents: Hydrocolloids

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** verification (50%, periodic practical tests during the semester 20%, final answers to project works 30%).

## YEAR III, SEMESTER II

### TITLE OF THE DISCIPLINE: SUGAR TECHNOLOGY

**CODE:** D29IPAL646

**ECTS CREDITS:** 4

**SUBJECT TYPE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** To acquire knowledge, skills and competences related to the technological process of obtaining sugar and sugar products.

**COURSE CONTENT:** Raw materials used in the sugar and sugar products industry. Chemical composition of sugar beets. Sugar production technology: Initial processing of sugar beets. Extraction of sugar from beet pulp (diffusion). Purification of diffusion juice. Evaporation of thin juice – obtaining thick juice. Boiling sugar. Crystallization of sugar. Sugar refining. Wet sugar processing – Drying sugar. Refining raw sugar from sugar cane. Jellie production technology. Raw materials used in the production of jellies. Overview of the technological process. Production technology of caramel products (candies, caramels, fondant): Raw materials used in the manufacture of caramel products. Overview of the technological process.

Chocolate production technology: Raw materials used in chocolate production. Overview of the technological process. Use of by-products in the sugar industry

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (60%, periodic practical tests during the semester 40%).

### TITLE OF THE COURSE: MACHINERY IN THE FOOD INDUSTRY II

**CODE:** D29IPAL647

**CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge of the basic engineering principles and methods for understanding the construction and technological aspects specific to equipment in the food industry. The principles of operation and knowledge of the most representative equipment in the food industry. Design principles, knowledge and application of constructive and functional/technological sizing specific to equipment in the food industry.

**COURSE CONTENT:** Sifting, calibration and sorting equipment: constructive/functional description of representative equipment; constructive/technological design. Grinding equipment: constructive/functional description of the representative equipment; constructive/technological design. Mixing equipment: constructive/functional description of the representative equipment; constructive/technological design. Centrifugal equipment: constructive/functional description of the representative equipment; constructive/technological design. Filtration equipment: constructive/functional description of the representative equipment. Food sterilization equipment: constructive/functional description of representative equipment. Thermal processing equipment for vegetables and fruits: Constructive/functional

description of the representative equipment; Constructive/technological design. Equipment for the preservation of vegetables and fruits: Constructive/functional description of the representative equipment; Constructive/technological design. Mixing and mixing equipment for the meat products industry: Constructive/functional description of representative equipment. Thermal processing equipment for meat and meat products: Constructive/functional description of the representative equipment. Sausage and salami processing equipment: Constructive/functional description of the representative equipment. High pressure/vacuum preservation equipment: Constructive/functional description of representative equipment.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (colloquium answers 50%; final answers to periodic laboratory tests and project tests 30%; laboratory notebook 20%).

### TITLE OF THE DISCIPLINE: ANIMAL RAW MATERIALS

**CODE:** D29IPAL648

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge of the breeds of animals for slaughter, the evaluation of the animals quality, the structure and composition of the meat. Knowledge of fishery products, their composition and their nutritional value. Understanding the changes that occur in muscles after slaughtering and their influence on technological processes and product quality. Knowledge of the structure, physical properties and chemical composition of milk, eggs and honey. Control of the quality of animal raw materials.

**COURSE CONTENT:** Raw materials for slaughter; Morphological structure, chemical composition and quality of meat; Changes occurring in the muscle after the slaughter of the animal; Fishery products; Milk; Eggs; Honey.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Checking (answers to exam 60%, seminar activity 20%; regular testing 15%).

### TITLE OF THE DISCIPLINE: TECHNOLOGY OF WINE, VINEGAR AND DISTILLED BEVERAGES II

**CODE:** D29IPAL649

**ECTS CREDITS:** 5

**DISCIPLINE TYPE:** Specialized discipline (SD)

**DISCIPLINE OBJECTIVES:** aims to provide students with a solid foundation in the processes and technologies used for the industrial processing of fruits and vegetables. The curriculum combines fundamental theoretical aspects with practical applications, covering various technologies for processing fruits and vegetables into preserved forms such as dehydration, freezing, thermal sterilization, fermentation, and more.

During the lectures, detailed study is conducted on the technological flows involved in each stage of the processing, with an emphasis on optimizing conditions to maintain product quality, safety, and hygiene. The educational program also encourages the development of

skills in analysis and quality control, utilizing specific analytical methods to verify the compliance of products with national and European standards.

Thus, the discipline prepares students to occupy specialized positions in the food industry, including roles in quality control, research and development, contributing to the assurance of a safe, healthy, and high-quality product flow for consumers.

#### **COURSE CONTENTS**

**Freezing preservation:** This method involves lowering the temperature of fruits and vegetables to preserve freshness, nutritional value, and flavor. Freezing slows down enzymatic activities and microbial growth, thereby extending the shelf life of the products. Key aspects include proper freezing techniques, packaging, and storage conditions to prevent freezer burn and quality degradation.

**Thermal treatment preservation:** This process involves applying heat to destroy bacteria, yeasts, molds, and enzymes that cause spoilage. Examples include pasteurization, sterilization, and blanching. Thermal treatments are crucial for ensuring safety, extending shelf life, and maintaining product quality without significantly affecting sensory properties.

**Preservation through lactic fermentation:** This traditional method uses beneficial lactic acid bacteria to ferment fruits or vegetables, producing lactic acid that inhibits pathogenic microbes. Fermentation not only preserves the products but also enhances flavors, improves digestibility, and can increase probiotic content. Common examples include sauerkraut, kimchi, and fermented cucumbers.

**Preservation by marination:** Marination involves soaking fruits and vegetables in solutions containing acids (such as vinegar or citrus juice), salt, herbs, and spices. This method imparts flavor, reduces microbial activity, and extends shelf life. It is widely used for preparing pickles, relishes, and flavored vegetables.

**Preservation with antiseptics:** This technique employs chemical agents with antiseptic properties to inhibit or kill microbial growth on fruits and vegetables. Suitable antiseptics must be approved and used within safe concentration limits. This method is used to enhance microbial safety during processing and storage.

**Quality control in the vegetable and fruit canning industry:** This involves monitoring and ensuring that preserved products meet safety, quality, and regulatory standards. Techniques include microbiological testing, chemical analysis, and visual inspections. Effective quality control ensures that canned products are safe for consumption, have consistent quality, and adhere to national and European regulations and standards.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (answers to exam 70%, final answers to Laboratory works 30%).

**TITLE OF THE DISCIPLINE: VEGETABLE AND FRUIT PROCESSING TECHNOLOGY II**

**CODE:** D29IPAL650

**ECTS CREDITS:** 5

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** aims to provide students with a solid foundation regarding the

processes and technologies used for the industrial processing of fruits and vegetables. The curriculum combines fundamental theoretical aspects with practical applications, covering various technologies for processing fruits and vegetables into preserved forms such as dehydration, freezing, thermal sterilization, fermentation, and others.

The technological flows involved in each stage of the process are studied in detail, with a focus on optimizing conditions to maintain product quality, safety and hygiene. The educational program also promotes the development of analysis and quality control skills, using specific analytical methods to verify the compliance of products with national and European standards.

Thus, the discipline prepares students for specialized positions in the food industry, including quality control, research and development, helping to ensure a flow of safe, healthy and high-quality products for consumers.

**COURSE CONTENT:** Freezing preservation: This method involves lowering the temperature of fruits and vegetables to preserve freshness, nutritional value, and flavor. Freezing slows down enzymatic activity and microbial growth, extending the shelf life of products. Key aspects include correct freezing techniques, packaging, and storage conditions to prevent some manufacturing defects and quality degradation.

**Heat Treatment Preservation:** This process involves using high temperatures to destroy bacteria, yeasts, molds, and enzymes that cause spoilage. Examples include pasteurization, sterilization, and tyndalization. Heat treatment is essential for safety, extending shelf life and maintaining product quality without significantly affecting sensory properties.

**Lactic fermentation preservation:** This traditional method uses lactic acid bacteria to ferment fruits or vegetables, producing lactic acid, which inhibits pathogenic microbes. Fermentation not only preserves products, but also improves flavors, digestibility, and can increase probiotic content. Common examples include sauerkraut, kimchi, and pickled cucumbers.

**Preservation by marinating:** Marinating involves introducing and keeping fruits and vegetables in solutions containing acids (such as vinegar), salt, and spices. This method imparts taste, reduces microbial activity and extends shelf life. It is intensively used for the preparation of pickles, relishes and flavored vegetables.

**Preserving with antiseptics:** This technique uses chemical agents with antiseptic properties to inhibit or kill the growth and development of microorganisms on fruits and vegetables.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (exam answers 70%, final answers of laboratory papers 30%).

**TITLE OF THE DISCIPLINE: SPECIALIZED PRACTICE**

**CODE:** D29IPAL651

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** The purpose of practical training is to develop appropriate skills and abilities

activities specific to the food sector.

**COURSE CONTENT:** Rules of conduct and occupational safety techniques in specialized laboratories. Work organization, first aid measures, PCI rules. Introduction to laboratory activity (containers, utensils and laboratory equipment); Signing of occupational safety forms.

*Food Industry Equipment I/II*

-Equipment for the oil industry; Equipment for the meat industry; Equipment for the milling and bakery industry (the activities are carried out in the laboratories of the Faculty of Horticulture/production or research units/economic agents that have a compatible and relevant field of activity for the student's specialization)

*Food Quality Control*

Evaluation of quality characteristics: general methods and techniques; Implementation of HACCP system in food manufacturing technology (in a specialized facility); Organoleptic examination of beer. Determination of alcohol concentration and acidity; Wine analysis. Determination of organoleptic characteristics, total acidity, alcohol concentration for white wines. Fat analysis. Determination of iodine index and saponification index. Organoleptic analysis and determination of the fat content for margarine (the activities are carried out in the laboratories of the Faculty of Horticulture/production or research units/economic agents that have a compatible field of activity relevant to the student's specialization).

*Principles and methods of food preservation*

Food preservation through heat; Preservation of food products by cold; Preservation of food products by dehydration (activities are carried out in the laboratories of the Faculty of Horticulture/production or research units/economic agents that have a compatible field of activity relevant to the student's specialization).

*Grinding and baking technology I*

Determination of flour quality by baking test method; The influence of the amount of yeast and salt on the quality of dough and bread; The influence of leavening time on the quality of bread; Bread analysis. Determination of the organoleptic characteristics, porosity and acidity of white bread (activities are carried out in the laboratories of the Faculty of Horticulture/production or research units/economic agents that have a compatible field of activity relevant to the trainee student's specialization). Completion by the students of the Framework Agreement on the internship with the necessary data (in the presence of the tutor designated by the faculty).

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** verification (answers to colloquium 80%; periodic practical testing during the semester 20%).

**TITLE OF THE DISCIPLINE: PACKAGING, LABELING AND DESIGN IN THE FOOD INDUSTRY**

**CODE:** D29IPAL652

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** Product and packaging design in the food industry.

**COURSE CONTENT:** Considerations regarding the design concept and activity. Industrial aesthetics in foodstuffs: the importance of industrial aesthetics for food production. The influence of design on product quality. Product development and their life cycle. Two-component product and packaging design system. Food design – basic elements of product design. Packaging design – basics of packaging design

Product packaging system with two components in design. Two-component product packaging system. Modern marking and labelling of food products. Elements that also define brand functions. Classification of trademarks. Eco-labeling of food. Modern food labelling. Basic concepts of food labelling Current requirements for food labelling. Food packaging. Packaging and packaging methods – terminology. Raw materials and materials used in the packaging industry Pulp packaging. Plastic packaging. Packaging used for the main food groups. Preparing packaging for packaging Washing, sanitizing and sterilizing packaging. Washing glass packaging. Washing of metal packaging. Washing plastic packaging. Measuring food. Food packaging methods. Specific aspects of food packaging in relation to consumer protection. Types of migration between products, packaging and the environment. Symbols for consumer and environmental protection. The relationship between product, packaging and environment. The impact of packaging on the environment. Coding systems for the recycling of plastic packaging materials

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** verification (answers to the exam 40%, periodic practical tests during the semester 20%, final answers to the project works 40%).

**TITLE OF THE DISCIPLINE: ECOLOGY AND ENVIRONMENTAL PROTECTION**

**CODE:** D29IPAL653

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** knowledge of the structure, functions and relationships in natural and anthropogenic ecosystems, knowledge of the impact produced by anthropogenic activities on the environment, knowledge of the ways of environmental protection.

**COURSE CONTENT:** Introductory notions (Definition, brief history and development, importance, ecological laws and principles, levels of organization of the living world). Ecosystem (definition, classification).

Biotope (geographical, mechanical, physical, chemical factors, interaction of abiotic factors). Biocenosis (structure, biocenosis structure indices, interspecific relationships, trophic structure of biocenosis). Ecosystem functions (energy function, circulation of matter, self-regulation). Ecosystem productivity. Ecosystem dynamics (variation of biocenoses, ecological successions). Population ecology. The Ecosphere (concept, composition, global circuit of matter). The main major ecosystems on the globe (aquatic biomes). The main major ecosystems on the globe (terrestrial biomes). Ecology of anthropogenic systems (agricultural, urban, rural, industrial ecosystems). Environmental damage (fire, overexploitation of resources, introduction of new species into the ecosystem, erosion, construction of dams and canals). Environmental damage (air pollution, soil pollution, water pollution, pollution of anthropogenic systems). Nature protection (necessity, ecological bases of environmental protection, protection of nature worldwide and in Romania, reconstruction of ecosystems, protected areas). Legal protection of the environment (regulations, environmental policy, institutions with attributions in the field)

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** verification (answers to colloquium 50%; periodic practical testing during the semester 50%).

<b>TITLE OF THE DISCIPLINE:</b> <b>ENTREPRENEURSHIP IN THE FOOD PROCESSING SECTOR</b>
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**CODE:** D29IPAL545

**ECTS CREDITS:** 3

**TYPE OF DISCIPLINE:** Complementary discipline (CD)

**OBJECTIVES OF THE DISCIPLINE:** The course deals with the aspects faced by entrepreneurs when they want to transform a business opportunity into a viable company that creates value and offers the opportunity for students to formulate their own approaches and develop their skills to become successful entrepreneurs.

**COURSE CONTENT:** Identifying business opportunities. Developing successful business ideas. The road from business idea to business opportunity. Ways to identify new product opportunities. PEST analysis. Peter Drucker's sources. Consumers, competition, suppliers and distributors – sources of new product ideas. Marketing for entrepreneurs. Market-size and content. Methods and techniques for forecasting potential market and demand. Marketing strategy. Customer identification: segmentation, targeting, positioning. The value proposition offered to customers. Marketing mix. Product Policy. Pricing policy. Distribution Policy. Promotion policy. Estimation of turnover and costs related to marketing activities. Sales strategies. Strategies for the growth of the entrepreneurial company. Business planning. Business Plan – Features, Advantages Types of Business Plans. The structure of the business plan. Feasibility of the business idea The need to carry out a feasibility study for the materialization of the business idea. Market research. Importance, objectives, primary research, secondary research, SWOT analysis.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** verification (answers to colloquium 50%; periodic practical testing during the semester 10%, preparation of business plan 40%).

<b>TITLE OF THE DISCIPLINE:</b> <b>ENTREPRENEURSHIP IN THE HORTICULTURAL SECTOR</b>
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**CODE:** D29IPAL654

**ECTS CREDITS:** 3

**TYPE OF DISCIPLINE:** Complementary discipline (CD)

**OBJECTIVES OF THE DISCIPLINE:** The course deals with the aspects faced by entrepreneurs when they want to transform a business opportunity into a viable company that creates value and offers the opportunity for students to formulate their own approaches and develop their skills to become successful entrepreneurs.

**COURSE CONTENT:** The entrepreneurial process. The importance of entrepreneurship. Characteristics of entrepreneurs. Developing business ideas. Identifying opportunities. Techniques for generating ideas. The components of the feasibility analysis and the impact of its results on the success of the business. Notions of commercial legislation. Notions of tax legislation. Marketing for entrepreneurs. The business model. The components of an effective business model. Elaboration of the business plan.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** verification (answers to colloquium 50%; preparation of business plan 50%).

#### YEAR IV, SEMESTER I

<b>TITLE OF THE DISCIPLINE:</b> <b>MILLING TECHNOLOGY</b>
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**CODE:** D29IPAL755

**ECTS CREDITS:** 5

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge of raw materials, conservation principles, technological processes, machinery and finished products in the meat industry.

**COURSE CONTENTS:** Raw materials for slaughter; Technology of animal processing in slaughterhouse; Morphological structure, chemical composition and meat quality; Changes occurring in the muscle after the animal slaughter; Preservation of meat by refrigeration and freezing; Meat salting; Thermal treatments used in the meat industry; Meat processing; Sausage manufacturing and technology; Technology of canned meat products.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (answers to exam 60%, laboratory activity 20%; laboratory regular testing 20%).

<b>TITLE OF THE DISCIPLINE:</b> <b>QUALITY CONTROL AND ASSURANCE IN THE FOOD INDUSTRY</b>
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**CODE:** D29IPAL756

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)  
**OBJECTIVES OF THE DISCIPLINE:** Knowledge of the general methods and techniques for evaluating the characteristics of food quality.

**COURSE CONTENT:** The modern concept of quality. The evolution of the concept of quality. Current guidelines on quality definition. The concept of quality management. Components of food quality: hygienic quality; nutritional quality; sensory quality; quality of use or service, presentation; technological quality; economic quality. Fundamentals of modern food quality - Aspects of the importance of nutrition and the relationship between nutrition and health. Characteristics and functions of food. Nutritional advantages and disadvantages of the main food groups. The relationship between food quality and consumer protection. Evolution of consumer protection. Consumer protection in relation to food. Food quality assessment. General techniques for assessing the characteristics of food quality. Verification rules. Food Quality Assessment – Documents that prescribe and certify the quality of food. Process control in the food industry. Control system of raw materials, materials, packaging, spare parts, equipment. Quality control of bread and bakery yeast. Quality control of pasta and biscuits. Quality control of chocolate and some confectionery and pastry products. Quality control of butter and other edible fats.

**LANGUAGE OF INSTRUCTION:** Romanian  
**ASSESSMENT METHOD(S):** Exam (exam 60%, periodic practical tests during the semester 10%, final answers to laboratory works 30%).

**TITLE OF THE COURSE: TECHNOLOGIES IN THE MEAT INDUSTRY**

**CODE:** D29IPAL757

**ECTS CREDITS:** 5

**TYPE OF DISCIPLINE:** Specialized discipline (SD)  
**OBJECTIVES OF THE DISCIPLINE:** Knowledge of raw materials, preservation principles and methods, technological processes, machinery and finished products in the meat industry.

**COURSE CONTENT :** Raw materials for slaughter; Animal processing technology in the slaughterhouse; Morphological structure, chemical composition and quality of meat; Changes that occur in the muscles after slaughtering the animal; Preservation of meat by refrigeration and freezing; Salting the meat; Heat treatments used in the meat industry; Meat processing; Meat Preparation Manufacturing Technology; The technology of making canned meat.

**LANGUAGE OF INSTRUCTION:** Romanian  
**ASSESSMENT METHOD(S):** Exam (exam answers 60%, laboratory activity 20%; final laboratory test 20%).

**COURSE TITLE: OIL AND MARGARINE TECHNOLOGY**

**CODE:** D29IPAL758

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)  
**OBJECTIVES OF THE DISCIPLINE:** To know and understand the stages of the technological process of obtaining oil and margarine.

**COURSE CONTENT:** General information about the oil and margarine industry. The technological process of obtaining sunflower oil. Oilseed processing operation. Crude oil refining process and extraction. Hydrogenation of vegetable oils and margarine production. Use of by-products and waste from the vegetable oil industry

**LANGUAGE OF INSTRUCTION:** Romanian  
**ASSESSMENT METHOD(S):** Exam (exam answers 80%; laboratory verification 20%).

**TITLE OF THE DISCIPLINE: MALT AND BEER TECHNOLOGY**

**CODE:** D29IPAL759

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)  
**OBJECTIVES OF THE DISCIPLINE:** Knowledge of the general principles, methods and procedures involved in the malt and beer industry; Appropriate use of technological methods and procedures in the malt and beer industry; Training of practical skills of working with specific equipment in malt and breweries, as well as the correct application of technological procedures; Knowledge and application of quality control methods throughout the technological process, including sensory, physicochemical and microbiological analysis of raw materials and finished products.

**COURSE CONTENT:** The course addresses the technological, biochemical and microbiological processes involved in obtaining malt and beer – two products of major importance in the food industry. The course provides theoretical and practical knowledge on the selection and preparation of raw materials (cereals, hops, water, yeasts), the transformation of barley into malt by germination and controlled drying, as well as the stages of brewing: malt grinding, brewing, fermentation, maturation and filtration. Emphasis is placed on quality control at every stage of the process, compliance with hygienic-sanitary norms and the use of modern production equipment. At the same time, the discipline addresses issues related to technological innovations, the diversity of types of beer, as well as the economic and cultural impact of this industry. By studying this subject, students acquire skills necessary for working in breweries, quality control laboratories, and malt production facilities.

**LANGUAGE OF INSTRUCTION:** Romanian  
**EXAMINATION METHOD:** verification (course evaluation 70%, continuous evaluation 30%)

**TITLE OF THE COURSE: TECHNOLOGIES IN THE ALCOHOL AND YEAST INDUSTRY**

**CODE:** D29IPAL760

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)  
**DISCIPLINE OBJECTIVES:** Technologies in the alcohol and yeast industry is a specialized discipline that aims to train the theoretical and practical skills necessary to understand the processes of obtaining ethyl alcohol and yeast used in the food industry.

**COURSE CONTENT:** The course addresses in detail the technological stages of alcohol production through the fermentation of sugary, starchy or cellulosic raw

materials, as well as the processes of rectification and purification of the finished product. The processes of cultivation, multiplication and drying of industrial yeasts are also presented, along with the optimal fermentation and quality control conditions.

The course focuses on the knowledge of raw materials (molasses, cereals, fruits, agricultural residues), on the efficient use of resources and on the application of modern and sustainable technologies. Aspects related to the equipment used in distilleries and yeast factories, process automation, as well as compliance with safety, hygiene and environmental protection rules are analyzed. By studying this subject, students acquire essential skills for working in the alcoholic beverages, biofuels and yeast industries, as well as an integrated vision of the interaction between biochemical, technological and economic processes in these sectors.

**LANGUAGE OF INSTRUCTION:** Romanian

**EXAMINATION METHOD:** verification (course evaluation 70%, continuous evaluation 30%)

<b>TITLE OF THE DISCIPLINE: SENSORY ANALYSIS</b>
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**CODE:** D29IPAL761

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Complementary discipline (CD)

**OBJECTIVES OF THE DISCIPLINE:** To develop the skills of characterizing the relationships between the physico-chemical and sensory properties of food. Developing the ability to use sensory analysis as a tool for assessing the naturalness and typicality of food

**COURSE CONTENT:** Definition of tasting and types of tasting, physiological bases of tasting. The sensory organs that participate in the tasting. Tasting of alcoholic beverages, tasting of dairy products and meat preparations. Tasting of confectionery and pastry products.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Verification (exam answers 80%, final answers to laboratory papers 20%).

<b>TITLE OF THE DISCIPLINE: SPECIAL BIOTECHNOLOGIES</b>
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**CODE:** D29IPAL762

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge on the quality of food products of plant and animal origin obtained through biotechnological processes. Understanding and acquiring knowledge in the field of food biotechnologies currently used in industry.

**COURSE CONTENT:** Special Biotechnologies (National and Global News; The importance of biotechnological processes for the food industry.) Biomass - a biotechnological substrate. Biomass production strategy. Natural raw materials. Availability of by-products. The impact of biomass on the future of biotechnologies. Enzymatic biotechnologies and enzymes used in the food industry. General classification of enzymes and their nature. Units of measurement of enzymatic activity. Enzyme preparations. Factors

influencing enzyme activity: enzyme inhibitors. Enzymatic biotechnological applications. Development of solid-state fermentation processes for food applications. The importance of SSF, SSF for the production of enzymes, SSF for the production of amino acids, SSF for the production of edible mushrooms, SSF for the production of aromatic compounds, vitamins and pigments. Fermentative biotechnologies for food. Introduction, fermented alcoholic products, fermented foods and spices, comparative analysis between traditional and modern processes. Biotechnologies for the production of polysaccharides used in food. Introduction, microbial polysaccharides used as food additives, exopolysaccharides as sources of aromatic components. Biotechnology for citric acid production. Microorganisms used for citric acid production, citric acid biosynthesis, factors affecting citric acid production, citric acid production by free and immobilized microorganisms, substrates used for citric acid production. Biotransformations with applicability in the food industry. General notions, Fructose syrups obtained through biotechnological processes, Oligosaccharides, Food flavors. Biotechnologies for the recycling of waste in the food industry. Treatment Evaluation, Process Monitoring and Control, Process Technologies (UASB Process, Anaerobic Fermentation Processes), Applications (Fermentation and Industrialization of Beverages, Dairy Industry).

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (answers to questions 70%, laboratory check 20%, project check 10%).

## YEAR IV, SEMESTER II

<b>TITLE OF THE COURSE: PROCESS AUTOMATION IN THE FOOD INDUSTRY</b>
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**CODE:** D29IPAL863

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** Knowledge and correct use of the terminology specific to automation, electronics and mechatronics in different contexts; knowledge and application of the primary methods of designing systems specific to the technologies of processing agricultural products; familiarization with the use of measuring instruments such as multimeter, oscilloscope, function generator; familiarize yourself with the use of the Matlab assisted design environment; familiarization and use of electronic devices and circuits that are part of the automatic subsystems.

**COURSE CONTENT:** Electronics for automation: DC electrical circuits, alternating current electrical circuits, magnetic and electromagnetic circuits, diode and transistor, switching circuits, linear algebra, logic gates, integration technologies. Automation with electromechanical elements: electromechanical devices, control diagrams. Pneumatic and electropneumatic automation: the basic pneumatic system, drive and control elements, electropneumatic components and circuits. Control schemes and automation: combinational control schemes, logic functions, canonical forms,

minimal forms, sequential control schemes, methods of synthesis of control schemes in different technologies.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** verification (answers to the colloquium 80% and final evaluation of practical works 20%).

**TITLE OF THE DISCIPLINE: BAKERY TECHNOLOGY**

**CODE:** D29IPAL864

**ECTS CREDITS:** 5

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** To provide knowledge about the main aspects of bakery technology, including raw materials and their quality, dough preparation and fermentation, baking processes, as well as the storage and preservation of bakery products.

**COURSE CONTENT:** Quality of flours, other raw materials and additives used in the bakery industry. Storage of raw materials and auxiliary ingredients. Preparation of raw materials and additives for production. Preparation and kneading of the dough. Kneading machines. Dough fermentation. Final leavening. Pre-baking operations for pieces of dough. The baking process. Storage and preservation of bakery products.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Written exam (70%) and final evaluation of practical papers (30%).

**TITLE OF THE COURSE: TECHNOLOGIES IN THE DAIRY INDUSTRY**

**CODE:** D29IPAL865

**CREDITS:** 5

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** To know the stages of the technological process of obtaining drinking milk and the technological processes of obtaining dairy products.

**COURSE CONTENT:** Knowledge of dairy raw materials for the design, development and use of production technologies; Chemical composition of milk. Factors influencing the chemical composition and characteristics of milk. Qualitative and quantitative reception of milk. National and European requirements. Primary treatments for milk. Drinking milk technology. Dietary acidic dairy products. The technology of obtaining consumer cream. Butter manufacturing technology. Technologies used in cheese production. The technology of making special cheeses. Ice cream making technology. SWOT analysis for a milk processing plant.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (exam answers 60%, periodic testing of practical skills during the semester 20%, final answers to laboratory work 20%).

**TITLE OF THE SUBJECT: PRACTICE FOR THE ELABORATION OF THE DIPLOMA THESIS**

**CODE:** D29IPAL866

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** The ability to draw conclusions and propose solutions based on the results of the analyses carried out, in accordance with the field of interest. Students' ability to carry out independent documentation and research work and to generate original data and conclusions. The diploma project must demonstrate the graduate's professional maturity and meet the requirements. Certain requirements in terms of content, form and scientific level. Preparation of the bachelor's degree.

**COURSE CONTENT:** Standards on ethics in scientific research and rules for writing a bachelor's thesis. Completion of the structure and bibliography of the work as a result of the study of the specialized literature. Review of the literature based on the academic sources recommended by the scientific advisor and the sources considered relevant by the student. Meetings with representatives of the private sector to discuss current and future issues in the agri-food sector. Completion of the research methodology to achieve the proposed objectives. Practical and research internship. Collection of experimental data. Processing and interpretation of research data. Writing the paper. Preparation of the presentation for the defense of the diploma thesis.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Oral presentation of the diploma thesis 100%.

**TITLE OF THE SUBJECT: ELABORATION OF THE DIPLOMA THESIS**

**CODE:** D29IPAL867

**ECTS CREDITS:** 4

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** To provide students with the necessary knowledge to prepare a diploma project based on the information acquired throughout the entire university training cycle.

**COURSE CONTENT:** Bibliographic documentation necessary for the preparation of a technological project. Material balance based on the manufacturing technology. Sizing of equipment based on the material balance. Preparation of technical datasheets. Sizing and designing storage spaces for raw materials and finished products. Thermal balance. Calculation of economic indicators for the designed technological process.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Verification (draft diploma thesis).

**TITLE OF THE COURSE: MARKETING**

**CODE:** D29IPAL868

**ECTS CREDITS:** 3

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** Planning, organizing and coordinating agri-food marketing activities; Interpretation of legislation in the food industry, as well as the basics of food; Marketing, strict compliance with the principles of human nutrition and

the regulations in force on food additives; Use of basic knowledge for interpreting marketing projects; Application of the principles of human nutrition and involvement in the selection of information necessary for the creation and completion of databases in the food industry; Objective evaluation of how to develop and implement the marketing strategy; Development of a marketing project with application in the food industry.

**COURSE CONTENT:** Introductory Marketing, Organization of Marketing Services, Agribusiness Market, Elements of Consumer Psychology, Market Segmentation, Marketing Forecasting, Marketing Mix, Market Making of the Economic Agent - an integral part of the marketing strategy.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Verification (answers to the exam 70%, final answers to laboratory works 30%).

#### **TITLE OF THE DISCIPLINE: MANAGEMENT**

**CODE:** D29IPAL869

**ECTS CREDITS:** 3

**COURSE TYPE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** To acquire knowledge on the basic notions related to the economic agent, in terms of its organization and functioning, as well as the ways of applying modern management techniques and methods.

**COURSE CONTENT:** The role of the food industry in the production of food for human consumption. Introductory elements of management. Operational management in the context of modern management. Production capacity and optimal ways of use in the food industry. Creation and development of the technical-material base in the food industry. Organization and management of food production. Organization of production in the food industry according to the types of enterprises. Technical-economic forecast in the food industry. Human Resource Management in the Food Industry. Standardization of work in the food industry.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Verification (exam answers – 70%, final evaluation of the seminar activity – 30%).

#### **TITLE OF THE DISCIPLINE: FALSIFICATION AND AUTHENTICATION OF FOOD PRODUCTS**

**CODE:** D29TPAL870

**ECTS CREDITS:** 5

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** Understanding food risk; Food quality control. Food expertise; Assimilation of the techniques and methods of analysis used to track the falsification of food products of animal and non-animal origin; Understanding the principles of HACCP according to the "Codex Alimentarius".

**COURSE CONTENT:** Course: Food: definition of the notion, food matrix; Food information; Food authenticity and traceability; Food risk analysis. Principles for assessing the risks of food and drinking water, related to human health; Food risk analysis. Chemical risk assessment; Food quality control. Food expertise; Food fraud; Assessing the safety of genetically modified foods;

Counterfeiting of food. Water falsification; Falsification of food of animal origin: meat, minced meat, meat preparations, dietary fats; Falsification of food of animal origin; Falsification of food of non-animal origin; Application of HACCP principles according to Codex Alimentarius; HACCP food safety management system. Hazard analysis, determination of critical control points. Laboratory: Research of monounsaturated fatty oils in virgin olive oil: application to oil research in oil residues; Identification of Arabic-Robust Blends in Soluble Coffee; The way of preservation can have an effect on the consistency and composition of Cymbopogon citrate oil; The dosage of glucose acid in honey by CZE, a new criterion for analyzing the characteristics of honey; Physical and chemical characteristics of deb Nyons oil; Evaluation of vanilla qualities; Tracking counterfeits on dairy products (milk and derivatives); Tracking counterfeits on meat and derived products; Physicochemical control of cereals and cereal derivatives (bread); Physicochemical control of alcoholic beverages.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (answers to the exam 80%, final answers to the seminar papers 20%).

#### **TITLE OF THE COURSE: ETHICS IN THE FOOD INDUSTRY**

**CODE:** D29IPAL871

**ECTS CREDITS:** 5

**TYPE OF DISCIPLINE:** Specialized discipline (SD)

**OBJECTIVES OF THE DISCIPLINE:** To know the ethical implications of food consumption and the role that food plays in social, cultural and political life. Knowledge of the links between food and cultural diversity. Knowledge of the interrelations between freedom, choice and food policy, between food and the environment.

**COURSE CONTENT:** Interactions between the individual and food. Determinants of food and identity. The ethics of feeding the human body. Food and cultural diversity. Food pluralism. Food security. Freedom, choice and food policies. Food labelling and freedom of expression. Food governance. Institutions and policies. Food at the intersection of bioethics and biopolitics. Consumerism. The ethics of consumerism. Food and the environment. Food, vulnerability and climate change. Biodiversity and development. Sustainability. Agriculture and animal consumption. Isolation agriculture. Animal welfare. Animal rights and food. Veganism. Food Justice. Individual and community identity in food sovereignty.

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** Exam (exam answers 50%, seminar activity 10%; preparation and presentation of the report 40%).

#### **TITLE OF THE COURSE: INNOVATION AND THE ENTREPRENEURIAL SYSTEM**

**CODE:** D29IPAL872

**ECTS CREDITS:** 3

**TYPE OF DISCIPLINE:** Complementary discipline (CD)

**OBJECTIVES OF THE DISCIPLINE:** The course aims to provide students with a framework to understand and appreciate the complexity of novel food development projects and to identify practical ways to develop entrepreneurship through innovations.

**COURSE CONTENT:** Innovation in bioengineering. The entrepreneurial system in the food industry. Establishing the market niche for innovative products. The process of product development in the company. Organization of the product development project. Product strategy development. Development of the concept of the product idea. Product design and process development. Marketing of the product. Product launch and evaluation. Developing a plan for a business based on innovative products

**LANGUAGE OF INSTRUCTION:** Romanian

**ASSESSMENT METHOD(S):** verification (answers to exam 40%, laboratory regular testing 60%).