

T.C.
FIRAT UNIVERSITY
KARAKOÇAN VOCATIONAL SCHOOL
FOOD PROCESSING DEPARTMENT FOOD TECHNOLOGY PROGRAM
COURSE CONTENTS

FIRST GRADE FIRST SEMESTER

TDİ - 101 TURKISH LANGUAGE I (2 0 2)

Language, Languages, Turkish language, Grammar, Word and sentence, Word types, Expression elements and types, Basic principles of proper and effective speech, Types of written and oral expression, Punctuation and spelling rules, Spelling disorders, Seminars, conferences, debates, etc.

YDİ - 101 FOREIGN LANGUAGE I (2 0 2)

Time clauses, What-who-where (wh) questions, auxiliary verbs (am, is, are), Countries and cities, Present continuous tense, how many and how much, Prepositions, Have-has got, Is- there are, quiz.

MAT - 101 MATHEMATICS I (2 0 2)

Sets, Numbers, Decimal fractions, Basic operations of complex numbers in the complex plane, Basic operations with polar coordinates of complex numbers, Algebraic operations, Polynomials and identities, Ratio and proportion, Equations, Inequalities.

KİM - 101 CHEMISTRY I (2 2 3)

Distinctive properties of matter, Mixtures, Phase changes, Basic laws of chemistry, Mole concept, atomic masses and determination of chemical formulas, Gas laws, Chemical reactions and calculations related to reaction equations, atomic structure and periodic table, Ionization energy, Radioactivity, Oxidation-reduction reactions.

AİT - 101 ATATURK'S PRINCIPLES AND HISTORY OF TURKISH REVOLUTION I (2 0 2)

Revolution and concepts related to revolution, The causes leading to the Turkish Revolution, The collapse of the Ottoman Empire, Reform movements in the Ottoman Empire in the 19th century, Intellectual movements aimed at saving the Ottoman state during its final period, The situation of the Ottoman Empire in the early 20th century, Political and military situation before World War I, World War I and the collapse of the Ottoman Empire, The causes of World War I, The outbreak of World War I and the Ottoman Empire's entry into the war, Turkish fronts in World War I, Plans for partitioning the Ottoman Empire, The end of World War I and the treaties signed, The National Struggle Period, Activities of minorities and separatist societies.

KGT - 103 GENERAL MICROBIOLOGY (2 2 3)

The basic principles of microbiology, The history and scope of microbiology, Important biological molecules, Microscopes used in microbiology, Classification and definition of microorganisms, Structure of prokaryotic and eukaryotic cells and their differences, Microbial development physiology and developmental stages, Beneficial and harmful effects of microorganisms, Isolation methods and the definition of immunology, The scope and application areas of microbiology, Cultural characteristics and morphology of microorganisms, Cell structure and metabolism, Reproduction methods, Isolation, cultivation, and factors affecting the development of microorganisms, Fungi, Viruses, Algae, Protozoa.

KGT - 105 UNIT OPERATIONS IN FOOD PROCESSING I (1 2 2)

Basic knowledge and concepts related to feedstock cleaning, Fundamental knowledge and concepts related to mechanical separation processes and systems used (Sorting, Classification, Screening, Sieving, Precipitation, Filtration and Centrifugation processes), Basic knowledge and concepts related to distillation, Basic knowledge and concepts related to extraction processes, Basic knowledge and concepts related to crushing and grinding processes, Basic knowledge and concepts related to homogenization, Basic knowledge and concepts related to mixing processes, Explanation of basic knowledge and concepts related to emulsions.

KGT - 107 FOOD INDUSTRY MACHINERY (2 2 3)

Methods of cleaning the raw material, Weighing and measuring instruments, Conveying and conveying devices, Washing and sorting machines, Stem separation, shelling and pitting machines, Sieve systems and classifying machines, Filtration systems, Centrifugation, Mixers, Mills - cutting machines, Presses, Homogenizers, Batch heat transfer systems, Tubular and plate heat exchangers, Evaporators, Heat treatment machines (Deaerators, deodorizers, condensers, scalding machines, cooking-roasting-frying machines, ohmic heating machines etc.), Drying systems, Packaging types, Washing-filling and sealing machines, Aseptic packaging systems.

FIRST GRADE FIRST SEMESTER ELECTIVE COURSES

KGT- 109 INFORMATION AND COMMUNICATION TECHNOLOGY (2 0 2)

Windows Operating System: Definition and use of the desktop and its objects, Start menu options, Microsoft Office: Opening, preparing and editing files, preparing headers and footers with Word, cell, row, column, page operations, cell formatting and formula writing with Excel, slide preparation and operations with Power Point, using options such as calendar, diary, mail control with Outlook, Internet Explorer: Using Explorer objects and searching the Internet.

KGT - 111 FIRST AID (2 0 2)

Basic first aid procedures, Structure and function of the human body, Primary and secondary assessment of the patient/injured person, Scene assessment, Basic life support in adults, Basic life support in children and infants, First aid for airway obstruction, First aid for external and internal bleeding, Wounds, types of wounds, and first aid for injuries, First aid for regional injuries, First aid for head and spine fractures, First aid for upper extremity fractures, dislocations, and sprains, First aid for hip and lower extremity fractures, dislocations, and sprains, First aid for diseases requiring emergency care, Poisoning, Heatstroke, burns and frostbite, First aid for foreign body aspiration, Emergency transport techniques, Rapid transport techniques for short distances, Transporting patients and injured persons using a stretcher.

KGT - 113 PROFESSIONAL ETHICS (2 0 2)

Examining the concepts of ethics and morality, Studying ethical systems, Investigating the factors influencing the formation of morality, Examining professional ethics, Analyzing the consequences of professional corruption and unethical behavior in professional life, Studying the concept of social responsibility.

KGT - 115 ENVIRONMENTAL PROTECTION (2 0 2)

Environmental regulation knowledge, Risk analysis, Waste storage, Personal protective measures, International health and safety warnings, Occupational health and safety regulations.

FIRST GRADE SECOND SEMESTER

TDİ- 102 TURKISH LANGUAGE II (2 0 2)

Structure of Turkish, Types of words in terms of their structure, Attachments and roots, Morphology, Word analysis, Noun and verb conjugations, Punctuation marks, Spelling rules, Communication methods, Types of written expression, Composition, petition writing, Expression disorders, Oral expression, Body language.

YDİ - 102 FOREIGN LANGUAGE II (2 0 2)

Using be and have, Present progressive tense, Past progressive tense, Nouns some-any, some special verbs and expressions, Simple past tense, expressing ability, Nouns pronouns, Making comparisons, Superlative forms, Present perfect tense, Adjectives, Adverbs.

MAT - 102 MATHEMATICS II (2 0 2)

Error analysis, Systems of linear equations, Curve fitting, Interpolation, Basic array operations, Arithmetic and geometric array operations, Basic functions, Types of functions, Exponential functions, Logarithms.

KIM - 102 CHEMISTRY II (2 2 3)

Definition of qualitative and quantitative analysis, Solutions, Solubility and solubility product, Factors affecting the solubility of precipitates, Precipitate formation, selective precipitation, Gravimetric analysis, Acids and bases, Definition of acid and base, conjugated acids and bases, Strong acids and pH, strong bases and pH, weak acids and pH, weak bases and pH, Neutralization, Hydrolysis, Buffer solutions, Titration, General titration technique, Strong acid and base titrations, titration of weak acid with strong base, titration of weak base with strong acid, titration of weak base with strong acid, back titration, Indicators, Oxidation-reduction equilibria, Electrochemical batteries, Electrolysis.

AİT - 102 ATATURK'S PRINCIPLES AND HISTORY OF TURKISH REVOLUTION II (2 0 2)

Reform movements in the Ottoman Empire, the French Revolution and its reflections in the Ottoman Empire, the Balkan and World Wars, the National Struggle, Erzurum and Sivas Congresses, the proclamation of the Republic, modernization and reform movements, Atatürk's principles, the basic qualities of the Republic of Turkey, the relations of the Republic of Turkey with its neighbors due to its strategic location, Atatürk's Turkish foreign policy (1923 - 1938).

KGT - 104 FOOD MICROBIOLOGY (3 2 4)

Important microorganisms in foods, Sources of microbial contamination, Internal and external factors affecting microbial growth, Indicator microorganisms in foods, Foodborne microbial diseases, Inhibition of microbial growth, Killing of microorganisms (Food preservation principles, prevention of contamination and removal of microorganisms, inhibition of microbial growth in foods and methods used in killing microorganisms), Microbiological spoilage in meat and products, Microbiological spoilage in milk and products, Microbiological spoilage in eggs and products, Microbiological spoilage in fruits and vegetables and products, Microbiological spoilage in canned foods, Microbiological spoilage in cereals and products, Microbiological spoilage in fermented alcoholic beverages, Pathogenic microorganisms causing food poisoning and prevention methods, Fermented foods and microorganisms playing a role.

KGT - 106 UNIT OPERATIONS IN FOOD PROCESSING II (1 2 2)

Heat treatments, Thermization, Pasteurization process, Sterilization process, Cooling technology, Freezing technology, Drying technology, Evaporation process, Extrusion process, Crystallization process, Boiling process, Coking process, Acid-alcohol fermentation, Food storage systems (Providing storage conditions, dry storage, cold storage, freezing storage), Storage in controlled and modified atmosphere, Radiation applications-irradiation.

KGT - 108 FOOD CHEMISTRY (3 0 3)

Food components, Composition changes in foods, Functional properties of food components, Water in foods (water activity etc.), Carbohydrates (mono, di, oligo and polysaccharides, Maillard reactions), Proteins (structures and properties of amino acids, proteins), Lipids (classification of lipids, chemical composition, lipid hydrolysis and oxidation), Enzymes (enzymatic browning etc.), Vitamins (vitamin losses), Mineral substances, Phenolic compounds and natural color substances, Flavor substances naturally found in foods, Toxic and contaminant substances, Understanding the importance and functions of alkaloids.

KGT - 110 LABORATORY TECHNIQUES (1 2 2)

Establishment purposes of laboratories, Warnings about laboratory work, Laboratory accidents and first aid, Introduction of the tools used in laboratories and teaching their use (glass, porcelain and metal materials), Introduction of technical instruments used in laboratories and teaching their use (Microscope, oven, autoclave, bain-marie, pH meter, distilled water device, muffle furnace etc.), Gravimetric analysis (ash determination, dry matter determination etc.), Volumetric analysis (solutions, calculation of solution preparations and solution preparation applications).

FIRST YEAR SECOND SEMESTER ELECTIVE COURSES

KGT - 112 STATISTICAL METHODS (2 0 2)

What is statistics, Basic statistical methods, Application areas, Statistical software packages, Descriptive statistics, Descriptive statistics, Variables (Discrete variables, Continuous variables), Data types, How to measure data, Steps in statistical research, Presentation of quantitative data obtained as a result of statistical analysis using tables and graphs (Stem-and-leaf plot, Frequency distribution table), Graphical representation of series (Line graph, Bar chart, Histogram, Pie chart), Graphical representation of bivariate numerical data (Scatter plot, Time series plot), Errors in data presentation, Examples and solutions related to qualitative, quantitative, and binary data applications, Measures of central tendency, Descriptive Statistics; Measures of Location (Arithmetic mean, Geometric mean, Harmonic mean, Mode, Median, Quartiles), Measures of Variability (Range, Mean standard deviation, Variance, Standard deviation, Coefficient of variation), Skewness measures (Pearson's skewness, Bowley's skewness), Kurtosis measures.

KGT - 114 FOOD PACKAGING (2 0 2)

Packaging, Functions of packaging, Expectations from food packaging in terms of consumer, producer, and trade, Relationship between food spoilage and the protective functions of packaging materials, Glass packaging, Paper and cardboard packaging, Wood packaging, Metal packaging (Aluminum and tin packaging materials, tin and coating methods, corrosion, rust, etc.), Plastics and plastic packaging, Multilayer packaging materials, Printed packaging materials, Film and foil-based packaging, Aseptic packaging in the food industry, Migration (Migration of substances from food to packaging, from packaging to food), Examples of packaging for different food products, Modified atmosphere packaging (Modified, controlled atmosphere), Smart packaging, Edible films, Packaging design, Coding and barcode systems in packaging, Labeling.

KGT - 116 QUALITY ASSURANCE AND STANDARDS (2 0 2)

Standard and standardization, Benefits of standardization, Importance of standards in production and service sectors, Types of standards, Standardization in Turkey and TSE, International standardization organizations, Calibration and metrology, CE Marking, Quality concept and quality approaches (Management quality and standards, environmental standards, quality management system models, participation in management, process management system, resource management system, quality control in production), Inspection, sampling, control charts and statistical quality control, Total quality management and its elements (customer orientation, leadership, full participation, continuous improvement), Techniques used in total quality management applications (PDCA cycle, brainstorming, multiple voting, flowchart, etc.), Strategic management and SWOT analysis, Quality control in food products.

KGT - 118 FOOD SAFETY (2 0 2)

The importance of food safety, Food safety in Turkey and globally, Principles of food legislation, What to consider when purchasing food products, Physical, chemical, and microbiological factors that cause food spoilage, Foodborne health risks, Food poisoning, Hygiene and sanitation in industrial food safety, Cleaning and disinfection in food enterprises, The importance of personal hygiene for food workers, Good manufacturing practices (GMP) in food enterprises, Genetically modified organisms and their health impact, Halal food and certification, Hazard analysis and critical control points (HACCP) system and its applications in the food industry (Principles of the HACCP system, advantages over traditional food safety, prerequisites for establishment, determination of critical control points, establishment of limits, setting up monitoring systems and documentation), Quality safety in food, product control and production.

KGT - 120 FOOD INDUSTRY WASTES (2 0 2)

Waste and wastewater treatment, Major food industry wastes, Milk processing wastes, Aquaculture processing wastes, Meat processing wastes, Oil processing wastes, Potato processing wastes, Carbonated beverage processing wastes, Bakery processing wastes, Value-added food wastes, Use of some value-added food additives, Examples of current waste treatment methods, Waste recycling, Composting, and Biogas production.

SECOND YEAR FIRST SEMESTER

KGT - 201 CEREAL TECHNOLOGY I (2 2 3)

Introduction to economically important cereals in the world, Grain structure of cereals, Anatomical structure and classification of wheat, Stages of wheat grain formation, Wheat diseases and pests, Parts of wheat grain, Physical, chemical, and analytical quality criteria in wheat, Chemical components of wheat (carbohydrates, proteins, lipids, vitamins, minerals, enzymes), Milling technology (Reception and storage, Cleaning, Wheat tempering, Wheat milling, Sieving, Flour blending), Semolina and pasta production, Cleaning stages in semolina production, Raw materials required for pasta production, Pasta production stages, Quality characteristics sought in pasta, Bulgur production stages, Tarhana making, Bread production stages.

KGT - 203 MILK AND DAIRY PRODUCTS TECHNOLOGY I (3 2 4)

Characteristics of milk, Quantity measurement in dairies, Storage of raw materials and auxiliary materials, Milk cleaning, Air and odor removal from milk, Separation of milk fat, Milk standardization, Milk homogenization, Pasteurized drinking milk, Sterilized drinking milk, Storage of drinking milk, Production of milk powder, Production of whey (PAS), Storage of dried dairy products, Production of white cheese, Production of cheddar cheese, Production of curd and melting cheese.

KGT - 205 MEAT AND MEAT PRODUCTS TECHNOLOGY I (3 0 3)

Definition of meat, Meat production and consumption rates, The importance of meat in terms of nutrition and health, Current problems in the meat sector, Solutions and recent developments in the sector, Physical, chemical, microbiological, and histological properties of meat, Biochemical reactions in the post-slaughter period, Meat preservation methods, Basic materials and additives used in the production of meat products, Basic principles of low and high-temperature applications in meat and products technology, Tumbling and massaging in meat technology, Basic machines used in meat product production, Production of fresh meat products (Slaughter methods, Slaughter stages, Standard shredding and production of fresh meat products), Production of frozen meat products, Production of slaughterhouse by-products (Production of carcass by-products and rendering products), Production of poultry meat products (Preparation for slaughter, slaughter, and shredding), Production of aquatic products (Fresh aquatic products and canned aquatic products), Basic principles of packaging for fresh and processed meat products, Quality criteria in processed meat products, Basic errors and defects that can be seen in processed meat products, Cleaning and disinfection in the meat industry.

KGT - 207 FRUIT AND VEGETABLE TECHNOLOGY I (3 0 3)

Definition of fruits and vegetables, Differences between fruits and vegetables, Composition of fruits and vegetables (Carbohydrates, vitamins, minerals, enzymes, etc.), Causes of deterioration and microbiology of fruits and vegetables, Preliminary processes used in the processing of fruits and vegetables (Washing, sorting and classification, stem and head-tip removal, core removal, peeling, chopping, etc.), Cold storage, Preliminary processes for frozen fruit and vegetable production, Freezing of fruits and vegetables, Raw material preparation processes for dried fruit and vegetable production, Fruit-vegetable drying.

KGT - 209 INTERNSHIP EVALUATION (0 2 1)

Practical training in institutions or organizations operating in the food sector. The internship spans a total of 30 working days. The primary objective is to gain practical experience and skills in professional subjects through hands-on training. Evaluation forms provided by the workplace, internship presentations, and reports prepared by students are reviewed by the internship committee to assess the internship performance.

KGT - 211 FOOD ADDITIVES (2 0 2)

Definition, utilization purpose, and classification of food additives. Key considerations in the use of food additives. Legal regulations and authorization for the use of food additives. Calculation of maximum residue limits of food contaminants. International organizations ensuring the safe use of food additives. Categories of food additives include acidity regulators, antimicrobial agents, antioxidants, emulsifiers, stabilizers (gums), anti-caking agents, bulking agents, leavening agents, colorants, flavoring substances, flavor enhancers, sweeteners, fortifying agents, starter cultures, enzymes, carriers and solvents, chelating agents, and phosphates.

SECOND YEAR FIRST SEMESTER ELECTIVE COURSES

KGT - 215 FOOD BIOCHEMISTRY (2 0 2)

Basic structure of living organisms, prokaryotic cells, eukaryotic cells, and photosynthetic eukaryotic cells. Definition and scope of biochemistry and food biochemistry. Carbohydrates, proteins, and lipids, behavior of lipids in aqueous environments, micelle formation. Biochemical changes in raw foods and reactions occurring during food processing. Non-enzymatic browning reactions (caramelization, ascorbic acid oxidation), Maillard reaction, and inhibition strategies for non-enzymatic browning. Biochemistry of food spoilage, primary and secondary metabolites. Biochemical basis of functional foods: probiotics, prebiotics, synbiotics, health benefits, phytochemicals, and bioactive compounds. Industrial applications of enzymes: classification, areas of use, enzyme activity, and changes during food processing. Fermentation processes, color, and compositional changes. Enzyme types: carbohydrases, proteases, esterases, and oxidoreductases. Relationship between food biochemistry and personal nutrition, food biochemistry and nanotechnology.

KGT - 217 BEVERAGES TECHNOLOGY (2 0 2)

The significance of water, its properties, and water treatment technologies. Essential and auxiliary raw materials used in carbonated beverage production. Production technologies for carbonated beverages, energy drinks, and sports drinks. Turnip juice production. Beer raw materials and production processes. Wine production processes (red and white wine). Production of distilled beverages such as brandy, cognac, whiskey, rum, tequila, raki, vodka, gin, sake, and liqueurs.

KGT - 219 PRINCIPLES OF NUTRITION (2 0 2)

Importance of nutrition, principles of proper, adequate, and balanced nutrition. Metabolism, digestion, absorption, and utilization of nutrients. Structure and composition of the human body, basics of cell biology. Age-related energy requirements, energy in the human body, personalized daily energy and protein calculations. Menu planning, nutrition during pregnancy, lactation, childhood, adolescence, and old age. Food pyramids and dietary guidelines. Macronutrients: carbohydrates, proteins, and fats—structure, function, digestion, absorption, utilization, metabolic disorders, and consumption recommendations. Vitamins: structure, mechanism of action, classification, and intake recommendations. Water balance and the importance of water, minerals, and their dietary recommendations. Non-nutritive substances and functional foods. Tailored nutrition plans according to health conditions and dietary patterns. Mass nutrition systems. Nutritional considerations for anemia, diabetes, celiac disease, cholesterol, food allergies, vegetarianism, underweight, eating disorders, overweight-obesity, lactose intolerance, osteoporosis, goiter, and cancer.

KGT - 221 FOOD TOXICOLOGY (2 0 2)

Definition of toxic food components and factors influencing their toxicity. Criteria and methods for toxicological assessment of foods. Toxicological testing methods for food products. Foodborne microbial and parasitic diseases and poisonings, including bacterial toxins, mycotoxins, and animal-derived toxins. Naturally occurring toxic compounds in foods. Pesticides and veterinary drug residues. Food additives, heavy metals, and environmental contaminants. Toxic compounds formed during food irradiation and processing. Safety of food packaging materials and migration of substances into food. Chemical and biological contaminants in drinking water and their control methods. Toxicological evaluation of novel foods and genetically modified organisms (GMOs) in food. National and international regulations regarding food toxicology.

KGT - 223 INSTRUMENTAL ANALYSIS (2 0 2)

Ray and its properties, Refractometry, Polarimetry, Ultraviolet and visible field (UV/VIS) spectroscopy, Infrared spectroscopy, Nuclear magnetic resonance spectroscopy (NMR), Mass spectroscopy, Fluorescence spectroscopy, Atomic absorption spectrometry, Emission and flame emission spectroscopy, Chromatographic methods (Liquid chromatography, Glass column chromatography, Thin layer chromatography, Ion exchange chromatography, High performance liquid chromatography (HPLC) and Gas chromatography (GC)), Electrophoretic methods.

SECOND YEAR SECOND SEMESTER

KGT - 202 CEREAL TECHNOLOGY II (2 2 3)

Biscuit production (Raw materials used in biscuit production, biscuit production process), sensory and chemical properties of biscuit, Wafer production (Raw materials used in wafer production, wafer production process), Cake production (Raw materials used in cake production, cake production process, quality criteria), Production of breakfast cereals (Effects of breakfast cereals on nutrition, Raw materials used in the production of breakfast cereals, stages of breakfast cereal production), Breakfast cereals, Extruded cereal products, Expanded whole grains, Legumes (Legumes types and classification, product cleaning criteria and methods).

KGT - 204 MILK AND DAIRY PRODUCTS TECHNOLOGY II (3 2 4)

Production of Tulum cheese, Civil cheese, Mihalic cheese, Halloumi cheese, Van Otlı cheese, Plain yogurt, Fruit yogurt, Buttermilk from yogurt, Buttermilk from milk, Kefir, Cream production, Cream pre-treatment, Cream maturation, Cream churning, Butter packaging and storage, Ice cream mixture preparation and quality control, Control of pre-treatment processes applied to the mixture, Freezing of the ice cream mixture.

KGT - 206 MEAT AND MEAT PRODUCTS TECHNOLOGY II (2 2 3)

Production of emulsion-based meat products, Sausage and salami production, Sausage production, Pastrami production, Canned meat product production, Roasting processes, Ham production, Smoked meat production, Tripe production, Smoking processes in meat products technology.

KGT - 208 FRUIT AND VEGETABLE TECHNOLOGY II (2 2 3)

Canned food production (Preliminary processes, preparation of brine or filling solution, filling and sealing of canned products, pasteurization), Tomato paste production (Preliminary processes, pulp extraction, concentration of tomato paste, filling and sealing of tomato paste, heat treatment), Jam production (Preliminary processes, cooking of jam, cooling and filling), Fruit juice production (Preparation of wort, pressing, clarification, filtration, concentration, reconstitution, filling and pasteurization), Fruit nectar production (Preparation of wort, heat treatment of wort, pulp extraction, pulp concentration, reconstitution, filling and pasteurization), Pickle production (Preliminary processes, brine preparation, filling and sealing, fermentation), Vinegar production (Preliminary processes, vinegar fermentation, maturation, clarification, and pasteurization).

KGT - 210 SPECIALTY FOODS TECHNOLOGY (4 0 4)

Honey production, Molasses production, Tahini halva production, Turkish delight (lokum) production, Ketchup production, Mayonnaise production, Cocoa processing, Chocolate production, Sugar production, Soft confectionery production, Hard confectionery production, Pestil (fruit leather), Cezerye (carrot Turkish delight), and Pismaniye (Turkish cotton candy) production, Production of powdered food products (instant soup, milk powder, egg powder), Tea production, Coffee production.

KGT - 212 LIPID TECHNOLOGY (4 0 4)

Formation of oils, composition, structure and classification of oils, Commercially important vegetable oils, Healthy nutrition and oils, Olive oil production (Pre-treatments, phase separation, separation of sediment and black water, olive oil filtration), Oil seed purchase criteria, Storage of oil seeds, Pre-treatments applied to oil seeds (Cleaning, drying, hull separation, grinding of seeds, roasting of seeds, oil extraction), Oil extraction methods (Mechanical pressing - solvent extraction), Refining of oils (Degumming, neutralization, dewaxing, bleaching, vintORIZATION, deodorization), Stages of oil production from various seeds, Margarine production (Raw materials, emulsification, cooling, processing, resting, packaging), Hydrolytic and oxidative deterioration of oils, Frying oils.

KGT - 214 HYGIENE AND SANITATION (2 0 2)

Definition and importance of hygiene and sanitation, Relationship between food and microorganisms, Sources of microbial contamination, General food hygiene practices, Cleaning and disinfection in food establishments (Use of water, detergents, disinfectants, and cleaning tools), Types of cleaning, Cleaning and disinfection stages and quality control, Cleaning and sterilization techniques, Cleaning and disinfecting agents and equipment, CIP (Clean-in-Place) and COP (Clean-out-of-Place) systems, Infrastructure requirements of food businesses, Personnel hygiene standards, Hygiene in restroom and handwashing areas, Periodic health examinations, Hygiene and sanitation practices before, during, and after production, Control of rodents, insects, etc., Water hygiene, Air hygiene, Disposal of residual and waste materials and ensuring harmlessness, Special food hygiene (Meat hygiene, dairy hygiene, aquaculture hygiene, poultry and egg hygiene).

SECOND YEAR SECOND SEMESTER ELECTIVE COURSES

KGT - 216 READY-TO-EAT FOOD TECHNOLOGY (2 0 2)

Introduction to catering technology, Preliminary processes in food production, Washing and sorting processes and related machines, Classification process and classification machines, Blanching process and its applications, Filling techniques, Exhausting processes and methods, Sealing techniques, Heat treatment methods in ready-to-eat food production, Additives used in ready-to-eat food production, Meat-based ready-to-eat foods, Fish-based ready-to-eat foods, and vegetable-based ready-to-eat foods.

KGT - 218 RESEARCH METHODS AND TECHNIQUES (2 0 2)

Definition of science, functions, types of knowledge, and knowledge categories, Overview of the history of science, Structure of scientific research, General research types, Scientific methods and different perspectives on these methods, Research problem identification, research ethics, literature review (Article/thesis review), Variables and hypotheses, Population and sample, Sampling techniques, Data collection and methods (quantitative and qualitative data collection techniques), Data recording, analysis, interpretation, and reporting, Quantitative research (experimental designs, single-subject research, correlational research, survey research, causal-comparative research), Qualitative research, Practical applications of research methods and techniques.

KGT - 220 CATERING INDUSTRY (2 0 2)

Basic concepts in catering technology and nutrition, The importance of nutrition, Common nutrition mistakes, Food groups (Fruits and vegetables, Dairy products, Meat, Grains, Legumes, Fats, Sugars, and consumption guidelines), Definition and significance of mass food production, Historical development and classification of the catering industry (On-site production, service, etc.), Traditional and modern practices in the catering industry, Planning and organization of food production areas, Equipment used in the catering industry, Personnel in the catering industry, Food purchasing in the catering industry, Food storage and control in the catering industry, Menu planning (Athlete's menu, children's and youth menus, menu planning for the elderly, vegetarian menu, diabetic menu, menu for cardiovascular patients, menu cards, tray service menus), Calorie calculation, Food preparation and cooking methods in the catering industry, Food service and transportation methods in the catering industry, Cost control in the catering industry, Hygiene and sanitation in the catering industry, Quality control in the catering industry, Occupational safety in the catering industry, Key challenges in food and beverage operations.

KGT - 222 GENETICALLY MODIFIED FOODS (2 0 2)

Definition of GMOs (Genetically Modified Organisms), History of GMOs, Reasons for the production of GMO products, Stages of gene transfer, Gene transfer in plants and animals, Positive and negative aspects of GMOs, Effects of GMOs on human health, Effects of GMOs on biodiversity, Benefits and drawbacks of GMOs for farmers, Legal aspects of GMO product production, The global and Turkish perspective on GMOs, Public opinion on GMOs, GMO foods currently produced, General evaluation of GMOs.

KGT - 224 BUSINESS ADMINISTRATION (2 0 2)

Monitoring microeconomic data, Analyzing macroeconomic indicators, Identifying market gaps, Evaluating investment alternatives and selecting the most appropriate one, Conducting feasibility studies, Understanding the business environment, Demand analysis and forecasting, Determining the location of the business, Defining the legal structure of the business, Assessing workplace capacity and determining total investment costs and financing, Estimating income-expense accounts, Developing workplace and production plans, Executing investment installation procedures, Creating the appropriate structure and opening the business, Planning and organization, Leadership, coordination, and supervision, Conducting job analysis, Planning human resources and recruiting candidates, Employee selection, Providing orientation training and

evaluating employee performance, Ensuring employee training and career development, Job evaluation and compensation, Planning and organizing production to achieve production goals, Capacity and inventory planning, Identifying the target market and product development, Pricing strategies, Developing promotion and distribution policies and management. customer relations, Managing income and expense accounts, Managing debts and receivables, Managing assets and resources.