

KARABÜK ÜNİVERSİTESİ
LİSANSÜSTÜ EĞİTİM ENSTİTÜSÜ

DEPARTMENT OF FOOD TOXICOLOGY					
Content of Master's Degree in Food Toxicology with Thesis					
COURSE CODE	COURSE NAME AND CONTENTS	T	A	C	ECTS
SABE708	Medical Microbiology	3	0	3	8
Purpose and Content	<p>The aim of this course is to understand the importance of microorganisms and microbiology, to learn the basic laboratory techniques (sowing methods, Gram staining, Acid resistan staining, sports staining) to define prokaryotic cell biology (metabolism and genetics), nutritional and physical needs of microorganisms, and work with microorganisms.</p> <p>Systematic classification of microorganisms (bacteria, fungi, viruses), normal body flora, clinical tables caused by microorganisms, pathogenesis, sampling and transport principles, diagnostic tests for effect, cells forming the immune system in humans, functions and mechanisms, effects and resistance mechanisms of antimicrobial drugs.</p>				
TOKS701	Introduction to Toxicology Science	3	0	3	8
Purpose and Content	<p>The main purpose of this course is to enable the student to know the science of toxicology in a basic quality.</p> <p>Introduction to general toxicology, main lines of toxicology, toxicokinetics and toxicodynamics, the concept of xenobiotic in general terms, pollutants, environmental pollutants, endocrine deflectors, hormones and phytohormones, food contamination, industrial-industry pollutants, heavy metals, toxicology and similar general introduction conceptual contents are taught in general terms.</p>				
TOKS709	Food Toxicology	3	0	3	8
Purpose and Content	<p>The examination of toxic substances that occurs food production, preparation, storage and their effects on human health.</p> <p>Toxicology and Food Toxicology identification, natural toxic compounds in foods and examining the effects on health, chemical pollutants and observation of their effects.</p>				
TOKS712	Cellular and Molecular Toxicology	3	0	3	8
Purpose and Content	<p>To teach cytotoxicity and the changes that occur during the exposure of the cell to endogenous and exogenous poisons.</p> <p>Concepts and definitions related to cytotoxicity, cell-toxin relationship and cell's detoxification pathways, molecular changes occurring in the cell during exposure, mechanisms of cell orientation against exposure.</p>				

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TOKS713	Heavy Metals	3	0	3	8
Purpose and Content	Types and sources of heavy metals, damage mechanisms of heavy metals in the organism, mechanisms of action, place in nutrition. It is aimed to examine the definition, sources and physiopathological effects of heavy metals.				
TOKS714	Pesticides	3	0	3	8
Purpose and Content	To give basic information about pesticide chemistry techniques and applications. Pesticides, their properties, where they are used, classification of pesticides, preparation of pesticide formulation, chemistry and benefits of auxiliary substances in pesticide formulation, properties and behavior of frequently used insecticides, organochlorine, organophosphorus, carbamate and pyrethroid pesticides and their properties, the effects of pesticides on air, surface water and groundwater resources , behavior of pesticides in soil, sample taking for pesticide residue analysis, measuring devices, methods of reducing pesticides in food, stability tests, pesticides and their effects on human health, reducing the use of pesticides.				
TOKS716	Xenobiotic Metabolism	3	0	3	8
Purpose and Content	The main aim of this course is to have knowledge about enzymes involved in drug metabolism, metabolism of natural and unnatural xenobiotic and biotransformation of insecticides. Overview of enzymes involved in drug metabolism, drug metabolism, alcohol metabolism, nicotine metabolism, metabolism of natural products, food components and supplements, metabolism of unnatural xenobiotics, biotransformation of insecticides.				
TOKS717	Food Additives	3	0	3	8
Purpose and Content	Properties of food additives, classification, food additives used in the food industry, food additives used in the food industry and their effects on foods, to understand the opening of additives on labels. Definition of food additives, classification of food additives, intended use of food additives, effect of additives on foods, effect of additives on human health, legal regulations on food additives.				
TOKS718	Food Microbiology	3	0	3	8

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Purpose and Content	To give information about the biotechnological methods in the diagnosis and definition of pathogens developed for the control of food hygiene and sanitation in food safety systems. Definition and scope of biotechnology, general food biotechnology, principles of microbial growth, fermentor and bioreactor systems, mass transfer, yeast-based processes and products, bacteria-based processes and products, PCR, PCR Imaging Methods and general information about PCR types and utilization of PCR types in food microbiology, immunological tests and the use of immunological tests in food safety.				
TOKS719	Food Biotechnology	3	0	3	8
Purpose and Content	To give information about the biotechnological methods in the diagnosis and definition of pathogens developed for the control of food hygiene and sanitation in food safety systems. Definition and scope of biotechnology, general food biotechnology, principles of microbial growth, fermentor and bioreactor systems, mass transfer, yeast-based processes and products, bacteria-based processes and products, PCR, PCR Imaging Methods and general information about PCR types and utilization of PCR types in food microbiology, immunological tests and the use of immunological tests in food safety.				
TOKS720	Enzyme Kinetics	3	0	3	8
Purpose and Content	To apprehend importance of the enzymes in biochemical reactions, enabling to experimental enzyme studies. Basic information about enzymes, Michaelis-Menten kinetics, enzyme inhibition types, enzyme purification and activity measurement methods.				
TOKS721	Fortification of Foods with Bioactive Compounds	3	0	3	8
Purpose and Content	Objectives of this course are to understand of bioactive compounds as an extranutritional constituents that typically occur in small quantities in foods. They are being intensively studied to evaluate their effects on health. They are often incorporated into some form of delivery system instead of added directly in their pure form. The delivery systems prevent and/or increase the bioavailability of an added bioactive compound. In this respect, in this course provide knowledge on extraction, purification and isolation of bioactive compounds and technics used in food enrichment with bioactive compounds. Food sources of bioactive compounds, Effects of bioactive compounds on health, Extraction, purification and isolation technics of bioactive compounds from foods, Bioavailability and bioaccessibility of bioactive compounds, Edible delivery systems for bioactive compounds, Technics used in food enrichment, Innovative formulations for food applications.				
TOKS722	Genetically Modified Foods	3	0	3	8

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Purpose and Content	What is Genetically Modified Organism and what is not, To teach its benefits and harms. To teach analysis methods. Genetically Modified Foods: How Does It Affect Human and Animal Health? Genetically Modified Proteins and Health Risks, Molecular Dimension: The Results of Playing With Genes, The Introduction of Genetically Modified Foods, The Reasons for the Production of Genetically Modified Foods, Are Genetically Modified Foods Really Remedy for Hunger?				
TOKS723	Fermentation Technology	3	0	3	8
Purpose and Content	It is aimed to teach the production technologies of fermented foods and to give information about the fermentation processes of foods. Definition of fermentation, microorganisms involved in fermentation, fermentation biochemistry, production technologies of fermented products. Production methods of fermented foods. Fermenters, types of fermenters and microbial enzyme production technology.				
TOKS724	Toxicological Approaches in Food Processing Process	3	0	3	8
Purpose and Content	Objectives of course to understand the toxic effects and transformations in foods during drying, freezing, fermentation, refining, smoking and heat treatment applications used in the food industry. Drying techniques of foods and nutritional and toxicological changes, Freezing of foods and toxicological changes, Heat treatment used in the food industry, Toxic substances formed during heat treatment, Fermentation and refining processes and toxicological formations in foods, High pressure during heat treatment and toxicological effects, Packaging techniques of foods and possible toxic formations.				
TOKS725	Toxicological Approaches in Food Processing	3	0	3	8
Purpose and Content	Objectives of course to understand the toxic effects and transformations in foods during drying, freezing, fermentation, refining, smoking and heat treatment applications used in the food industry. Drying techniques of foods and nutritional and toxicological changes, Freezing of foods and toxicological changes, Heat treatment used in the food industry, Toxic substances formed during heat treatment, Fermentation and refining processes and toxicological formations in foods, High pressure during heat treatment and toxicological effects, Packaging techniques of foods and possible toxic formations.				
TOKS726	Enrichment of Foods with Bioactive Compounds	3	0	3	8

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Purpose and Content	Objectives of this course are to understand of bioactive compounds as an extranutritional constituents that typically occur in small quantities in foods. They are being intensively studied to evaluate their effects on health. They are often incorporated into some form of delivery system instead of added directly in their pure form. The delivery systems prevent and/or increase the bioavailability of an added bioactive compound. In this respect, in this course provide knowledge on extraction, purification and isolation of bioactive compounds and technics used in food enrichment with bioactive compounds. Food sources of bioactive compounds, Effects of bioactive compounds on health, Extraction, purification and isolation technics of bioactive compounds from foods, Bioavailability and bioaccessibility of bioactive compounds, Edible delivery systems for bioactive compounds, Technics used in food enrichment, Innovative formulations for food applications.				
TOKS727	Current Developments in Biochemistry	3	0	3	8
Purpose and Content	The aim of the course is to be able to follow current issues in the field of biochemistry, to gain information about planning multidisciplinary studies, to gain basic information about preparing publications. Basic biochemistry subjects, current research areas in biochemistry, relationship of biochemistry with other disciplines, literature review on biochemistry, converting data obtained from studies into articles.				
TOKS728	Functional Foods	3	0	3	8
Purpose and Content	Gain knowledge on food safety and quality management concepts. Develop knowledge on quality management, HACCP and food safety management systems and their relationships between each other. Develop ability to implement the HACCP system. Evaluate prerequisite programs, hazards and hazard analysis. Develop extensive knowledge about national and international standards in the area of food safety. Introduction to food safety and quality management; HACCP and food safety management systems (principles, definitions and terms used in standards, implementation stages); prerequisite programs; hazards and hazard analysis; linking HACCP and food safety management systems with quality management systems; national and international standards; application samples from the food industry.				
TOKS729	Food Safety Systems	3	0	3	8

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Purpose and Content	Gain knowledge on food safety and quality management concepts. Develop knowledge on quality management, HACCP and food safety management systems and their relationships between each other. Develop ability to implement the HACCP system. Evaluate prerequisite programs, hazards and hazard analysis. Develop extensive knowledge about national and international standards in the area of food safety. Introduction to food safety and quality management; HACCP and food safety management systems (principles, definitions and terms used in standards, implementation stages); prerequisite programs; hazards and hazard analysis; linking HACCP and food safety management systems with quality management systems; national and international standards; application samples from the food industry.				
TOKS730	Free Radicals and Antioxidants	3	0	3	8
Purpose and Content	It is aimed to examine the definition and sources of free radicals, antioxidants, physiopathological effects of radicals. Free radicals, reactive species and their sources, damage mechanisms of free radicals in the organism, antioxidants, mechanisms of action, antioxidants and free radicals in nutrition.				
TOKS731	Food-Drug Interaction and Safe Drug Use	3	0	3	8
Purpose and Content	Students should have basic information about drugs and learn the interactions of commonly used drugs with foods or beverages. After explaining the basic concepts of pharmacology, the effects of various drug groups on nutrition and their interactions with foods will be discussed.				
TOKS732	Probiotics, Prebiotic and Microbiota	3	0	3	8
Purpose and Content	Microorganism and the concept of probiotic bacteria, examination of these bacteria on the basis of species, prebiotic substances, teaching the probiotic-prebiotic relationship, as well as explaining the concepts of microbiota and microbiome. Course Content To explain the basic elements and differences related to microorganisms. Explanation of probiotic bacteria concept and properties and prebiotic, synbiotic concepts. Explaining the concepts of microbiota and microbiome and their relations with health.				
TOKS733	Gut Microbiota and Nutrition	3	0	3	8

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Purpose and Content	Identification and importance of gut microbiota, Effects of nutrition on gut microbiota, Effect of dietary components on gut microbiota, Diversity of gut microbiota and health. It aims to define the composition and diversity of microorganisms living in the intestines, which is defined as these condbrain, and to investigate the effects of nutrition on the viability and functionality of beneficial microorganisms.				
TOKS734	Sustainable Food Waste Management	3	0	3	8
Purpose and Content	Food loss and food waste concepts, Food losses in the food supply chain, Determination of food loss and food waste in the world and in Türkiye, Environmental effects of food waste, Traditional food waste techniques, Innovative food waste methods, Sustainability of food waste management and circular economy, Valorisation of fruit and vegetable agricultural wastes. To raise awareness in order to prevent food waste by learning the concept of food loss and waste correctly. It is to reduce the damage of the food wastes to the environment, to determine the right sustainable technique, to transform them into a value-added product.				
TOKS735	Food Hygiene, Sanitation and Durability	3	0	3	8
Purpose and Content	To have knowledge about removing microorganisms that threaten human health from their environment and protecting a healthy environment. Hygiene and sanitation practices, ways of preserving food, problems encountered in food safety.				
LUEE701	Scientific Research Techniques and Science Ethics	3	0	3	8
Purpose and Content	The main aim of this course is to examine the research process (problem determination, data collection, data analysis and interpretation of results) and scientific research methods (experimental method, description method, historical method, etc.) and to teach the target group the techniques of finding literature, collecting data, evaluating data and writing reports to enable students to conduct research while adhering to scientific ethics and values during and after the doctoral thesis process. History of science, ethical behavior, ethical violations, data collection and visualization in research processes, principles of experimental methods, data collection methods, report writing and review techniques.				

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TOKS797	Seminar	0	2	0	6
Purpose and Content	The aim of this course is to enable the students to collect information about current professional topics by making literature research in their fields, to synthesize the information they gather, to report and present and discuss. Gathering information on current professional issues. Literature research.				
TOKS7098D	Course Specialised Field	4	0	0	4
Purpose and Content	Course Specialised Field is a theoretical course proposed by a faculty member to share their knowledge, experience, and expertise in their scientific field with graduate students under their supervision. This course aims to educate students on scientific ethics and instill a strong work discipline.				
TOKS7098T	Thesis Specialised Field	4	0	0	4
Purpose and Content	Thesis Specialised Field is a theoretical course that the faculty member proposes to the graduate students he/she supervises in order to share the methods of conducting research in the current literature, following and evaluating the literature, and to establish and carry out the scientific foundations of the student's thesis / exhibition / project work.				
TOKS799	Thesis Study	0	1	0	26
Purpose and Content	The aim of this course is to provide students at the thesis stage with the ability to monitor, evaluate and discuss the literature on the subject they will study. In addition, it aims to develop students' knowledge and skills in terms of science ethics and scientific research methodology. Gathering information on current professional issues. Literature research. Scientific ethics. Scientific research methodology.				

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