

T.C.
FIRAT ÜNİVERSİTESİ
KEBAN MESLEK YÜKSEKOKULU MÜDÜRLÜĞÜ



ENVIRONMENTAL PROTECTION AND CONTROL PROGRAM COURSE PLAN AND COURSE CONTENTS

Keban
Elazığ

Keban Vocational School Timur Demir Street, 23700 Keban/ELAZIG e-mail: keban@firat.edu.tr Tel: +90 424 2370000-8526 Fax: +90 424 5712060

T.C.
FIRAT UNIVERSITY
KEBAN VOCATIONAL SCHOOL
DEPARTMENT OF ENVIRONMENTAL PROTECTION TECHNOLOGIES
ENVIRONMENTAL PROTECTION AND CONTROL PROGRAM
COURSE PLAN

1ST GRADE FALL SEMESTER						
Course Code	Course Name	C/E*	T	P	Cr	ECTS*
TRD109	Turkish Language I	Z	2	0	2	2
YDİ107	English I	Z	2	0	2	2
FU101	Introduction to University Life	Z	2	0	2	2
KİM101	General Chemistry	Z	2	0	2	3
MAT103	General Mathematics	Z	2	0	2	3
KÇK101	Environmental Principles	Z	3	0	3	5
KÇK103	General Ecology	Z	3	0	3	5
KÇK105	Environmental Microbiology	Z	2	2	3	4
KÇK107	General Biology	Z	2	0	2	4
Total			20	2	21	30

*C: Compulsory course, E: Elective course, T: Theoretical, P: Practical, Cr: Credit, ECTS: European Credit Transfer System.

1ST GRADE SPRING SEMESTER						
Course Code	Course Name	C/E*	T	P	Cr	ECTS*
TRD110	Turkish Language II	Z	2	0	2	2
YDİ108	English II	Z	2	0	2	2
KÇK102	Solid Waste Control	Z	2	2	3	5
KÇK104	Environmental Chemistry	Z	2	2	3	4
KÇK106	Environment and Public Health	Z	2	0	2	4
KÇK108	Water Quality and Control	Z	2	2	3	5
KÇK110	Environmental Impact Assessment	Z	2	0	2	5
	Elective course	E	2	0	2	3
Total			16	6	19	30
ELECTIVE COURSE (*)						
KÇK112	Renewable Energy Sources	E	2	0	2	3
KÇK114	Waste Recycling Methods	E	2	0	2	3
KÇK116	First Aid	E	2	0	2	3

* It is mandatory to choose one of the elective courses.

2ND GRADE FALL SEMESTER						
Course Code	Course Name	C/E*	T	P	Cr	ECTS*
AİT209	Ataturk's Principles and Revolutionary History I	Z	2	0	2	2
KÇK201	Hazardous Wastes	Z	2	1	3	3
KÇK203	Wastewater Treatment	Z	2	2	3	4
KÇK205	Physical Basic Operations	Z	2	1	3	4
KÇK207	Chemical Basic Operations	Z	2	1	3	4
KÇK209	Air Pollution and Control	Z	2	1	3	4
KÇK211	Professional Practice	Z	0	2	1	6
	Elective course	E	2	0	2	3
Total			14	8	20	30
ELECTIVE COURSE (*)						
KÇK213	Environmental Management Systems	E	2	0	2	3
KÇK215	Zero Waste Technology in Production	E	2	0	2	3
KÇK217	Occupational Health and Safety	E	2	0	2	3

* It is mandatory to choose one of the elective courses.

2ND GRADE SPRING SEMESTER						
Course Code	Course Name	C/E*	T	P	Cr	ECTS*
AİT210	Ataturk's Principles and Revolution History II	Z	2	0	2	2
KÇK202	Anaerobic Treatment	Z	2	1	3	3
KÇK204	Environmental Biotechnology	Z	2	0	2	3
KÇK206	Hydrology	Z	2	1	3	4
KÇK208	Soil Pollution and Control	Z	2	1	3	4
KÇK210	Industrial Pollution Control	Z	2	1	3	4
KÇK212	Environmental Legislation	Z	2	0	2	4
KÇK214	Water Supply and Sewage	Z	2	0	2	3
	Elective course	E	2	0	2	3
Total			18	4	22	30
ELECTIVE COURSE (*)						
KÇK216	Disasters and Disaster Management	E	2	0	2	3
KÇK218	Entrepreneurship	E	2	0	2	3
KÇK220	Urbanism and Environmental Planning	E	2	0	2	3

* It is mandatory to choose one of the elective courses.

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COURSE CONTENTS

COURSES (I. TERM)	C/E	T	P	Cr	ECTS
TRD109 TURKISH LANGUAGE I	C	2	0	2	2
Language, languages, Turkish Language, grammar, phonetic features of Turkish, phonetic and structural features of Turkish, structural features of Turkish, sentence knowledge, spelling rules and punctuation marks, application of spelling rules, application of punctuation marks.					
YDİ107 ENGLISH I	C	2	0	2	2
Verb Be, statements and questions, countries and nationalities, present simple tense, statements, verbs for daily routines, present simple questions, free time activities, verb Have / Has, family tree, there is / there are, places in a town, present continuous tense, rooms and furniture, can / can't, months of the year, present simple tense, present continuous tense, jobs.					
FU101 INTRODUCTION TO UNIVERSITY LIFE	C	2	0	2	2
Areas of responsibility, city and campus promotion, student groups and movements, career center, department heads, life on campus, career planning and time management, personal care and hygiene, healthy living and sports, disasters and emergencies and management, first aid, written and verbal communication, traffic and environmental awareness, academic title ranking and consultancy, domestic and international higher education and student mobility, quality policies, higher education school activities, project information, student projects, student affairs automation, distance education, continuing education center, disciplinary affairs, regulations, guidelines and senate decisions, grading system, passing courses, mobile technologies, short film techniques.					
KİM101 GENERAL CHEMISTRY	C	2	0	2	3
Matter and its distinctive properties, phase change, mixtures and separation methods, basic laws of chemistry, atomic structure and periodic table, mole concept, determination of atomic masses and chemical formulas, chemical bonds, chemical reactions and calculations related to reaction equations, radioactivity, qualitative and quantitative analysis, solutions, solutions and concentration, dilution of solutions, titration, acids-bases and pH, gas laws..					
MAT103 GENERAL MATHEMATICS	C	2	0	2	3
To be able to perform arithmetic and algebraic operations. To be able to calculate the power and root of a real number. To solve equations with roots, fractions and equations that can be transformed to second degree. Real and complex numbers, equations of second degree with one unknown. Root coefficient relations and solutions of inequalities in second degree equations. To be able to solve equations and inequalities. To be able to use trigonometric ratios. To be able to understand complex numbers. To solve determinant and linear equations, equation of a line in the plane, vectors, logarithms.					
KÇK101 ENVIRONMENTAL PRINCIPLES	C	3	0	3	5
Environment and definitions. Understanding the environment and the elements of the environment, such as air, water, soil, sound and aesthetics, and the factors that pollute these elements. Definition of Environmental Pollution, water, air, noise, soil pollution and control, problem solutions, solid waste, hazardous waste and control, environmental impact assessment. Industrial pollution. Agricultural pollution, thermal pollution. Global warming, greenhouse effect. Population, urbanization concepts. Recognizing national and international institutions, organizations and organizations related to the environment. Having information about the principles of creating environmental policies. Radiation					
KÇK103 GENERAL ECOLOGY	C	3	0	3	5
Ecological concepts, classifications and theories. Animal ecology, plant ecology, definition and characteristics of ecosystems, freshwater ecosystem, marine ecosystem, terrestrial ecology, protection and management of natural resources, carrying capacity, demographic characteristics, effects of pollution on ecosystems, energy in ecosystems, microbial ecology, model approaches in ecosystems.					
KÇK105 ENVIRONMENTAL MICROBIOLOGY	C	2	2	3	4
History and development of microbiology. Microscope and its use. Classification of microorganisms. Bacteria, molds, yeast, algae, viruses. Development, counting, identification, classification of microorganisms. Staining of bacteria. Nutritional media. Soil, water and atmospheric microbiology, importance of microorganisms in environmental engineering, use of microorganisms in biological treatment systems, microbiological processes, applications and laboratory studies in the evaluation of solid wastes.					
KÇK107 GENERAL BIOLOGY	C	2	0	2	4
Introduction to biology, differences between living and non-living things, structure of living things, structure and functions of macromolecules, microorganisms, biogenesis, cell theory, enzymes, genes and heredity, hormones, carbohydrates, lipids, phosphoglycerides, proteins, cell structure and cell organelles, photosynthesis-cellular respiration, cellular reproduction, plant kingdom, basic information about animals, human body tissues, organs and systems.					
COURSES (SECOND TERM)	C/E	T	P	Cr	ECTS
TRD110 TURKISH LANGUAGE II	C	2	0	2	2
Reading with comprehension and pleasure, acquiring the habit of reading, evaluating the text read, written expression, limiting a subject, making plans on this subject, writing sentences as paragraphs, written expression techniques and their application, introduction and application of written expression types, preparation of scientific review articles, verbal expression, ways to be successful in oral expression, forms and application of oral expression, types and application of oral expression.					
YDİ108 ENGLISH II	C	2	0	2	2
Past simple, verb BE, events and places to go, past simple actions, school subjects, past simple questions, parts of the body, future tense, be + going to, travel, countable and uncountable nouns, foods, clothes, weather, adjectives, comparatives adjectives, superlatives adjectives, geographical features.					
KÇK102 SOLID WASTE CONTROL	C	2	2	3	5

Definition and characteristics of solid waste, amount of solid waste and changes, analysis methods, cleaning works of settlements, collection and transportation of domestic solid waste, optimization in collection, transfer stations, evaluation of solid waste, evaluation of solid waste for energy production, composting and recycling methods.					
KÇK104 ENVIRONMENTAL CHEMISTRY	C	2	2	3	4
Introduction to environmental chemistry, laboratory definition, introduction, safety, laboratory consumables, sampling technique, sample taking, preparation and preservation methods, environmental chemistry solutions, case studies on the preparation of standard solutions, laboratory analysis techniques and analysis methods, instruments used in analysis, evaluation of analysis results, quantitative and instrumental analysis methods, acidity, alkalinity, color and turbidity determination methods, areas of use of conductivity, pH, strong and weak acids, bases, hardness, fluoride, chloride data, dissolved oxygen, biological oxygen demand, chemical oxygen demand, necessary organic chemistry and biochemistry principles.					
KÇK106 ENVIRONMENT AND PUBLIC HEALTH	C	2	0	2	4
Basic health concepts, environmental disease concept and toxicology, etiology and epidemiology concepts, formation of diseases, transmission and immunization, effects of air pollution on health, effects of water pollution on health, effects of soil pollution on health, effects of noise pollution on health, effects of radioactive pollution on health, effects of food pollution on health, environmental pollution and cancer, elimination of pollution effects. Disease-causing biotic factors. First aid					
KÇK108 WATER QUALITY AND CONTROL	C	2	2	3	5
Introduction to water quality and control, importance and properties of water, hydrological cycle, water pollution, water quality and discharge standards, drinking, utility and irrigation water properties, changes in water quality, factors affecting water quality, standards, basic principles of water quality protection..					
KÇK110 ENVIRONMENTAL IMPACT ASSESSMENT	C	2	0	2	5
Definition of EIA, its purpose, benefits, principles, preparation methods. Legal regulations, field studies, evaluation, minimization of impact, alternative projects, environmental impact assessment report and preparation principles. EIA report examples from various projects, Environmental impact assessment regulation.					
KÇK112 RENEWABLE ENERGY RESOURCES	E	2	0	2	3
Definition and types of energy, energy production sources, fossil fuels and their environmental effects, clean and renewable energy sources in the world and in Turkey, solar energy, wind energy, geothermal energy, biogas and energy production from solid wastes, nuclear and hydroelectric power plants and their environmental effects, energy obtained from the seas, hydrogen energy, energy production from boron.					
KÇK114 WASTE RECOVERY METHODS	E	2	0	2	3
What is waste? Harms of waste. Waste types, waste recycling methods, recycling methods applied according to waste type, environmental impact values of waste, benefits of recycling of waste. Definition of recovery, recycling, waste reduction, reuse and disposal terms. Contribution of recovery to national economy, benefits to environment and human health. Recycling symbols. Recyclable waste materials. Waste regulations, legal regulations and responsibilities imposed on institutions. Recycling statistics in Turkey and in the world. General stages of recycling system.					
KÇK116 FIRST AID	S	2	0	2	3
Basic applications of first aid, first and second assessment, basic life support for adults, basic life support for children and infants, first aid for respiratory tract obstruction, external and internal bleeding, wounds and wound types, first aid for regional injuries, upper extremity fractures, dislocations and sprains, first aid for diseases requiring emergency care, emergency carrying techniques, fast carrying techniques for short distances, carrying patients or injured people by creating a stretcher.					
COURSES (3RD TERM)	C/E	T	P	Cr	ECTS
AİT209 ATATURK'S PRINCIPLES AND HISTORY OF REVOLUTION I	C	2	0	2	2
Definitions of the terms revolution and history, world revolutions and the place of the Turkish revolution within them, characteristics of the Turkish revolution, Armenians under the Ottoman Empire, The Ottoman Empire in I. World War and the results of the war, the Armistice of Mudros and the occupation of the Empire, the beginning of the War of Independence, Atatürk's place and goal in the War of Independence, the Amasya circular, National congresses, Istanbul-Anatolia relations, the opening and first works of the Turkish Grand National Assembly, internal rebellions prevention, wars on the Eastern front, national fronts (Kuvayı milliye), Western front, the first international agreements made by the Turkish Grand National Assembly, the Lausanne Peace Treaty.					
KÇK201 HAZARDOUS WASTES	C	2	1	3	3
The concept of hazardous waste (characteristics, classification), special hazardous wastes (medical waste, waste oils, batteries and accumulators, waste tires), hazardous waste sources, legal legislation on hazardous wastes, collection, transportation and temporary storage of hazardous wastes; reduction, recycling and recovery of hazardous wastes, treatment of hazardous wastes with physical-chemical, biological and thermal processes, regular storage and removal of hazardous wastes, cleaning of areas contaminated with hazardous wastes.					
KÇK203 TREATMENT OF WASTEWATER	C	2	2	3	4
Characteristics of wastewater, treatment needs and receiving environment standards, treatment of used domestic and industrial wastewater, chemical, mechanical biological treatment systems, principles of treatment of wastewater from paper industry, sugar industry, oil industry, leather industry and other related industries. Mechanical treatment, screens, grit traps, grease traps, sedimentation tanks, biological treatment, activated sludge method and systems, aeration systems, mechanically aerated tanks, oxidation ditches, stabilization tanks, trickling filters, fluidized bed treatment systems, rotating biodiscs, sludge treatment and removal.					
KÇK205 PHYSICAL BASIC OPERATIONS	C	2	1	3	4
Basic operations concepts unit systems. Neutralization-balancing-design. Mixing. Precipitation-sedimentation. Filtration-vacuum filtration. Flotation-flotation. Disinfection. Adsorption. Ion exchange.					
KÇK207 CHEMICAL BASIC PROCESSES	C	2	1	3	4
Chemical oxidation-reduction. Air stripping-stripping unit processes. Thermodynamics. Chemical precipitation. Gas transfer-aeration. Electrochemical processes. Membrane processes. Activated sludge. Sludge treatment. Stabilization ponds and aerated lagoons					
KÇK209 AIR POLLUTION AND CONTROL	C	2	1	3	4
Causes and effects of air pollution, pollutants, pollution sources, air pollution meteorology, definition of air pollution control regulations, air pollution measurement techniques and analysis methods, particle measurements, measurement of sulfur gases, measurement of nitrogenous gases, control of air pollution according to source and pollutant characteristics, air pollution standards, laboratory studies on air pollution measurement and analysis.					
KÇK211 PROFESSIONAL PRACTICE	C	0	2	1	6
Preparing and presenting a presentation about the internship, reviewing the prepared internship notebook and evaluating it with questions.					
KÇK213 ENVIRONMENTAL MANAGEMENT SYSTEMS	E	2	0	2	3

Definition of Environmental Management System, Objectives of Environmental Management System, structure of Environmental Management System, environmental policy, environmental management program, environmental training, Environmental procedures, emergency preparedness and works to be done in such cases, processing and measurement, Environmental Management System Audit, connection between Environmental Management System ISO 14001 and Quality Standards System ISO 9001, legal status and applications in Turkey.					
KÇK215 ZERO WASTE TECHNOLOGIES IN PRODUCTION	E	2	0	2	3
Examining the methods of evaluating waste, creating a waste management plan and a zero waste management plan, Zero Waste System Installation, Zero Waste Regulation, Zero Waste Project and Applications in Production					
KÇK217 OCCUPATIONAL HEALTH AND SAFETY	E	2	0	2	3
The concept of occupational safety, the economic importance of occupational safety studies, employer and employee duties and responsibilities, the Occupational Health and Safety Law No. 6331, definition of occupational accidents, causes and prevention methods, fire and fire extinguishing methods, occupational health and safety in hand tools, physical, chemical, biological risks, hazards and types of hazards, methods and solutions in accident investigations, occupational health and safety application principles, appropriate job placement, evaluation of workplace environmental factors, analysis of occupational health and safety risks, periodic control examination, basic first aid information, occupational diseases and legal liability, emergency plans. Environmental risk assessment methods and calculations.					
COURSES (4TH TERM)	C/E	T	P	Cr	ECTS
AİT210 ATATURK'S PRINCIPLES AND HISTORY OF REVOLUTION II	C	2	0	2	2
Declaration of the Republic, the first constitution, Atatürk's principles and revolutions (revolutions in social, economic, administrative, cultural and other fields), Turkey and the world states during the period of single-party governments, the Republican period, internal rebellions, the foreign policy of the Government of the Republic of Turkey, treaties, the Orient and the Armenian issue, attempts at transition to the multi-party era, Atatürk's death, II. World War and Türkiye, developments in Türkiye's foreign policy, the Middle East and the Republic of Türkiye, Türkiye's principles and goals in the period of rapid progress.					
KÇK202 ANAEROBIC TREATMENT	C	2	0	2	3
Anaerobic treatment. Advantages and disadvantages. Kinetics, microbiology and biochemistry of anaerobic treatment. Anaerobic contact reactors. Anaerobic filters. Anaerobic sludge bed reactors. Anaerobic fluidized bed reactors. Classical anaerobic sludge digesters. Two-stage anaerobic treatment systems. Anaerobic sequencing batch reactors. Operating conditions of anaerobic reactors. Control of anaerobic processes..					
KÇK204 ENVIRONMENTAL BIOTECHNOLOGY	C	2	0	2	3
Biotechnology definition, history, classification. Biotechnological applications in various fields. History of environmental technologies. Introduction to environmental biotechnology. Environmentally friendly technologies. Application examples of environmental biotechnologies. Phytoremediation. Bioremediation.					
KÇK206 HYDROLOGY	C	2	1	3	4
Definition of hydrology, system concept in hydrological studies. Hydrological cycle, water resources of the world, definition and subject of hydrology, precipitation; occurrence of precipitation, types and measurement, evaporation; factors affecting evaporation and measurement, infiltration; calculation of infiltration capacity, factors affecting infiltration capacity, groundwater, surface flow, hydrograph analysis, characteristics of basins.					
KÇK208 SOIL POLLUTION AND CONTROL	C	2	1	3	4
Introduction to soil pollution, definition. Physical, chemical and biological properties of soils. Effects of heavy metals, pesticides and pesticides, chemical fertilizers, industrial wastes, solid wastes, radioactive wastes on soil pollution. Methods of eliminating soil pollution.					
KÇK210 INDUSTRIAL POLLUTION CONTROL	C	2	1	3	4
Industrial pollution sources, industrial pollution detection methods, determination of waste reduction methods in industrial processes, legislation on hazardous wastes in sectors, industrial solid wastes, industrial gas and dust wastes, advanced treatment methods, pretreatment, joint treatment and treatment methods in various industry applications.					
KÇK212 ENVIRONMENTAL LEGISLATION	C	2	0	2	4
General knowledge of law, Environmental Law and environmental regulations related to sectors, implementation of the law, international environmental law and its applications.					
KÇK214 WATER SUPPLY AND SEWERAGE	C	2	0	2	3
Water supply and sewerage systems; Population estimation methods and determination of water needs; Water collection facilities; Pressurized transmission lines, Water tanks; Network systems; Sewerage systems.					
KÇK216 DISASTERS AND DISASTER MANAGEMENT	E	2	0	2	3
Disaster and Emergency Concepts, Scope, Classifications, Natural Disasters, Geological Disasters, Atmospheric Disasters, Biological Disasters, Technological Disasters, Fires, Disaster Management and Disaster Logistics in the World and in Turkey. Management of Environmental Risks that May Arise After Disasters and Environmental Health Measures.					
KÇK218 ENTREPRENEURSHIP	E	2	0	2	3
Information on entrepreneurship, getting to know the entrepreneur, testing entrepreneurial characteristics, innovation and invention, business idea development and creativity exercises (brainstorming), starting a business, the concept and elements of a business plan (market research, marketing plan, marketing techniques, making promotions with the right tools, production plan, management plan, financial plan), studies to reinforce the elements of a business plan (market research, marketing plan, production plan, management plan, financial plan), points to be considered in writing and presenting a business plan, filling out KOSGEB documents.					
KÇK220 URBAN PLANNING AND ENVIRONMENTAL PLANNING	E	2	0	2	3
Urbanism, history of urbanism, reasons for the establishment of cities and factors determining settlement patterns, urban theories, basic problems of urbanism and regional planning in Turkey. Industrialization, urbanization and environmental problems.					

NOTE: A 30-day internship is required during the spring semester summer term of the first year.