COURSE LIST

Institute of Natural and Applied Sciences

Field: Environmental Engineering

Course Title	Code	ECTS Credit	COMU Credit	Lecturer
Groundwater Pollution	ULP-21-ÇM001	7.5	3	Assist. Prof. Dr. Hasan Göksel Özdilek
Energy, Economy and the Environment	ULP-21-ÇM002	7.5	3	Assist. Prof. Dr. Hasan Göksel Özdilek
Professional English 1	ULP-21-ÇM003	3	2	Assist. Prof. Dr. Hasan Göksel Özdilek
Environmental Ecology	ULP-21-ÇM004	6	3	Assist. Prof. Dr. Hasan Göksel Özdilek
Soil and Groundwater Contamination and Control	ULP-21-ÇM005	5	3	Assist. Prof. Dr. Hasan Göksel Özdilek
Professional English 2	ULP-21-ÇM006	3	2	Assist. Prof. Dr. Hasan Göksel Özdilek
Water Supply and Pollution Control	ULP-21-ÇM007	7	4	Assist. Prof. Dr. Hasan Göksel Özdilek
Environmental Management Systems	ULP-21-ÇM008	4	2	Assist. Prof. Dr. Derya Altunbaş

Course Code	ULP-21-ÇM001
Name of the Course in English	**Groundwater Pollution**
Name of the Course in Turkish	**Yeraltı Suyu Kirliliği**
Language of the Course	English
Level of the Course	
Lecturer	**Assistant Prof. Dr. Hasan Göksel Özdilek**
ECTS Credit	7.5

COMU Credit	3
Description	Soil composition, soil-water content, soil-air content, etc. Soil potassium, sulphur and other micro nutrients, physical and chemical treatment, temperature, nutrient, soil carbon and other factors that play important roles in pollutant transport in soil, groundwater movement, soil particle and soil-water interactions Soil as a water reservoir, groundwater and its general properties, contaminant plumes Contaminated sites, types of contamination, determination of contaminant levels and volumes Management of contaminated lands Acidic soil and treatment techniques, soil contamination due to traffic, air pollution and slurry pollution factors as well as industrial sources The most important waste sources of agricultural soils: nitrogen and phosphorus. Industrial soil pollution problems Salt-affected soils and treatment techniques, salt water intrusion to groundwater resources, its effects on soil and groundwater quality Soil erosion and sediment control, chemical and biochemical groundwater and soil treatment systems Energy, mass balance and type of reactors used in soil and groundwater pollution remediation Volume reduction of contaminants, site selection, in-situ and ex-situ treatment options Soil and groundwater pollution control methods specifically thermal

	treatment techniques, Air stripping, Soil-vapor extraction, Active carbon, soil flushing, stream stripping, chemical oxidation, membrane processes, ion exchange technologies, stabilization and solidification, incineration. General Review of the Course

Course Code	ULP-21-ÇM002
Name of the Course in English	**Energy, Economy and the Environment**
Name of the Course in Turkish	**Enerji, Ekonomi ve Çevre**
Language of the Course	English
Level of the Course	
Lecturer	**Assistant Prof. Dr. Hasan Göksel Özdilek**
ECTS Credit	7.5
COMU Credit	3
Description	Global energy and the environmental quality dilemma Past issues and new problems in energy security. Policy measures for global environmental problems. Sustainable energy utilization. Energy sources and their environmental impacts. The status of the global environment. Climate changes due to the increase in greenhouse gases as predicted by climate models**.** Deforestation and desertification in developing countries. Energy-economy interactions in stabilizing CO_2 and other greenhouse gas emissions. Modelling economically efficient abatement of greenhouse gases**.** Macroeconomic costs and other side-effects of reducing CO_2 and other greenhouse gas emissions**.** The effects of CO_2 and other greenhouse gas reduction policies on energy markets in the world**.** Long-term strategies for mitigating global warming. The role of technology in energy/economy interactions: A view from Japan Global and renewable energy: Potential

	and policy approaches**.** Energy efficiency: New approaches to technology transfer**.** Decarbonization and desulphurization as a long-term energy strategy. Energy issues in developing countries. The crisis of rural energy (primarily biomass) in developing countries**.** The developing world: the new energy consumer**.** The role of rural energy**.** Long-term energy-environmental strategy strategies of developing countries. Leapfrogging strategies for developing countries**.** Alternative energy resources: olive seeds, geothermal, solar, etc. and their economic analyses. A development-focused approach to the environmental problems of developing countries Economic development, energy, and the environment in Turkey and the European Union.

Course Code	ULP-21-ÇM003
Name of the Course in English	**Professional English 1**
Name of the Course in Turkish	**Mesleki İngilizce 1**
Language of the Course	English
Level of the Course	
Lecturer	**Assistant Prof. Dr. Hasan Göksel Özdilek**
ECTS Credit	3
COMU Credit	2
Description	Teaching of fundamental subjects in Environmental Engineering; Professional terminology; Prefix and suffix usage Professional terms in Environmental Engineering; General introduction; Definition of "Engineering" text Prefix and suffix usage; word and terminology issues Environmental Engineering water supply and water treatment terminology and text reading and writing practice. Environmental Engineering air pollution and its control terminology, reading assignment. Urban infrastructure,

	sewerage, sweeping, etc. terminology in Environmental Engineering Environmental Engineering wastewater treatment terminology (physical (preliminary) methods) Environmental Engineering wastewater treatment terminology (chemical and biochemical processes) Environmental Engineering wastewater treatment systems biological methods and disinfection - MID TERM EXAMINATION Environmental Engineering water pollution, stagnant and flowing water science terminology, reading practice Environmental Engineering alternative energy sources and material flow, total quality management terminology Biotechnology terminology used in Environmental Engineering Laboratory devices and equipment and their techniques used in Environmental Engineering Technical terminology and technical communication - An analogy Translation practice, summation, description and narration.

Course Code	ULP-21-ÇM004
Name of the Course in English	**Environmental Ecology**
Name of the Course in Turkish	**Çevre Ekolojisi**
Language of the Course	English
Level of the Course	
Lecturer	**Assistant Prof. Dr. Hasan Göksel Özdilek**
ECTS Credit	6
COMU Credit	3
Description	Ecology is the science that examines relationships between living creatures and nonliving resources, their importance on all types of activities in earth, geology, material and energy balance as well as human impact on ecosystems Definition of ecology, ecological connections, life on earth Ecological Cycles, integrity of

	cycles, hydrologic cycle Energy (solar energy and other energy resources) and material cycles within the world Sulfur, carbon, nitrogen and phosphorus cycles Population Ecology, predator-prey relationships Human Populations, population growth Role of humans in nature– MID TERM EXAMINATION Environmental contamination and its effects on ecological integrity Environmental perspectives, use of materials, renewable resources and nonrenewable resources Environmental Standards and Environmental Economy, Natural Resource Economics Environmental Planning and Sustainable Development Student Presentations Student Presentations General Overview of the course.

Course Code	ULP-21-ÇM005
Name of the Course in English	**Soil and Groundwater Contamination and Control**
Name of the Course in Turkish	**Toprak ve Yeraltı Suyu Kirliliği**
Language of the Course	English
Level of the Course	
Lecturer	**Assistant Prof. Dr. Hasan Göksel Özdilek**
ECTS Credit	5
COMU Credit	3
Description	Soil composition, soil formation and morphology, soil-rock relationship, environmental factors that affect soil quality Classifications of soils, soil types and their importance Fundamentals of soil mechanics, soil-water content, soil-air content, etc. Soil potassium, sulphur and other micro nutrients, physical and

	chemical treatment, temperature, nutrient, soil carbon and other factors that play important roles in pollutant transport in soil, Site and underground characterization. Quantitative risk evaluation and Ecological risk assessment Soil colloids and their chemical properties, groundwater movement, soil particle and soil-water interactions Soil as a water reservoir, groundwater and its general properties Contaminated sites, types of contamination, determination of contaminant levels and volumes Management of contaminated lands Acidic soil and treatment techniques, soil contamination due to traffic, air pollution and slurry pollution factors The most important waste sources of agricultural soils: nitrogen and phosphorus. Industrial soil pollution problems – MID TERM EXAMINATION Salt-Affected soils and treatment techniques, salt water intrusion to groundwater resources, its effects on soil quality Soil erosion and sediment control, chemical and biochemical groundwater and soil treatment systems Energy, mass balance and type of reactors used in soil pollution remediation Volume reduction of contaminants, site selection, in-situ and ex-situ treatment options Soil pollution control methods specifically

	thermal treatment techniques, Air stripping, Soil-vapor extraction, Active carbon, soil flushing, stream stripping, chemical oxidation, membrane processes, ion exchange technologies, stabilization and solidification, incineration. Hazardous materials and treatment techniques, contamination control using thermal technology Soil survey and Land-Use Planning General Review of the Course

Course Code	ULP-21-ÇM006
Name of the Course in English	**Professional English 2**
Name of the Course in Turkish	**Mesleki İngilizce**
Language of the Course	English
Level of the Course	
Lecturer	**Assistant Prof. Dr. Hasan Göksel Özdilek**
ECTS Credit	3
COMU Credit	2
Description	Technical writing and expressions, academic writing assignment Workplace communication, professional communication techniques Summarizing a technical report, scanning and narrating techniques Graphics, maps, pictures and tables (Visuals), use of visuals in Professional communication, animations and presentations Business Proposals and Technical Documents Explaining professionally what something is – MID TERM EXAMINATION Using technical terminology in reports, environmental engineering terminology How to write a resume, how to submit a resume, putting Professional experience in text Team work and interdisciplinary applications Preparing a technical report, planning, compiling resources

	Preparing a technical report, progress in writing Peer review of technical reports after shaping it Finalizing technical report General Course Review

Course Code	ULP-21-ÇM007
Name of the Course in English	**Water Supply and Pollution Control**
Name of the Course in Turkish	**Su Getirme ve Kirlilik Kontrolü**
Language of the Course	English
Level of the Course	
Lecturer	**Assistant Prof. Dr. Hasan Göksel Özdilek**
ECTS Credit	7
COMU Credit	4
Description	Management of water supply systems, hydrological cycle and quality of water resources Population growth and water need projections Reservoirs, groundwater, wells and their protection Water distribution systems, Aqueducts and water pipes Water harvesting technologies for arid and semi-arid regions Supply-demand curves, water storage, fundamentals of water distribution Water and health (an introduction)

	Potable water quality Wise-water use techniques Acceptance of reduction of water used by society Sustainable water supply strategies and solutions - MID TERM EXAMINATION Water pollution due to sewerage, stagnant and flowing water science terminology, reading practice Storm Water Flow Sewerage general considerations, how much water in sewer systems expected after a known amount is supplied – Quantitative aspects Sewer Materials Sewer Appurtenances Design of Sewer Systems Sewer Construction and Maintenance Characteristics of Sewage Sewage Disposal Sewerage units at dwellings, institutions and other facilities Design practice, computation and summation of a water or sewerage system of a city.

	Full Project Work

Course Code	ULP-21-ÇM008
Name of the Course in English	**Environmental Management Systems**
Name of the Course in Turkish	**Çevre Yönetim Sistemleri**
Language of the Course	English
Level of the Course	
Lecturer	**Assistant Prof. Dr. Derya Altunbaş**
ECTS Credit	4
COMU Credit	2
Description	Introduction of basic concepts in environmental management A step by step outline of the rational decision analysis process Comprehensive analysis of environmental impacts of investments (especially in industrial, energy and building sectors) A short introduction to Environmental and Resource Economics Management of Common Resources Elicitation of decision-maker values (What do they prefer? Where?) Willingness to cover environmental damages (if any). The value of environmental resources and services. Validation procedure. –DISTRIBUTION of TERM PAPER TOPICS

	Ethical principles for environmental management Recreation, cultural experience and life values and standards National and International Environmental Quality Standards Aesthetical value of landscape and cityscape Ecological concepts (a need or luxury?) Sustainability, footprints and harvesting economics Toxicity of pollutants for human being and ecosystems (Toxicity acceptance – Toxicity reduction to what level?) Agricultural systems and land use with emphasis on developing countries. Climate, ecosystems and anthropogenic emissions Natural disasters and the role of environmental management for crisis management Policy making related to the Environmental Management in the

	European Union General evaluation of the course