

CYPRUS UNIVERSITY OF TECHNOLOGY

Department of Environmental Science and Technology

Subject available in English through individual supervised study

Academic Year 2019 - 2020

Autumn Semester (Sept. – Dec.)

Course Code	Course Title	ECTS
CEN_103	Biology	3
CEN_103 Lab	Biology Lab	2
EST_211	Environmental Microbiology	4
EST_211E	Environmental Microbiology Lab	2
CEN_303	Engineering Economics	5
EST_411	Environmental Biotechnology I	4
EST_411E	Environmental Biotechnology I Lab	2
EST_403	Project Thesis	12
LCE_660	Greek Language and Culture	4
LCE_104	English I for Academic Purposes	4

Spring Semester (Jan. – May)

Course Code	Course Title	ECTS
EST_314	Toxicology II	4
EST_314	Toxicology II Lab	2
EST_403	Project Thesis	12
LCE_660	Greek Language and Culture	4
LCE_104	English I for Academic Purposes	4

Description of Courses

Autumn Semester

EST_211: Environmental Microbiology

Introduction to Microbiology. Cell biochemistry, DNA-RNA and their function. Introduction to biology and Environmental Microbiology. Growth of microorganisms and their metabolism. Biodiversity of microorganisms, bacteria, archaea, yeast, algae. Microorganisms in the environment and biofilm formation. Growth and loss processes in nature and role of microbes in the biogeochemical cycles of elements (carbon, nitrogen and sulfur). Extremophilic microorganisms, their mechanisms and applications (halophilic-halotolerant, thermophilic, psychrophilic microorganisms). Acidophilic microorganisms and metal bioleaching. Anaerobic microorganism and their applications. Bioremediation of soil and polluted environment (oil contamination). Cellulose, hemicellulose and Lignin biodegradation. Pathogens microorganisms and methods to measure them. Colony forming unit method. Techniques to isolate and to characterize microorganisms. Molecular microbiology techniques: PCR- DGGE

EST_331: Environmental Economics and Policy

Principles of economics: Demand, supply, market equilibrium under perfect competition and monopoly. Welfare analysis: Consumer and producer surplus. Efficient allocation and pricing of scarce natural resources. Principles of cost-benefit and cost-effectiveness analyses of environmental issues. Valuation of non-market environmental goods. Economics of pollution control. Comparison of environmental policy instruments: regulations, emission taxes/charges and tradable emission permits. Economic growth, international trade and environmental quality. Evolution of environmental policy in the European Union.

EST_411: Environmental Biotechnology I

Introduction to environmental biotechnology. Cell biochemistry. Microbial growth and substrate utilization mechanism (anabolism and catabolism). Recombinant DNA technology. Environmental pollution and biodegradation of organic compounds. Soluble microbial products. Growth of microorganisms in close and open systems. Basic types of bioreactors. Recently developed bioreactors (membrane bioreactor and aerated biofilm bioreactor). Introduction to design of bioreactor. Biofilm formation and its role in bioreactor. Biotechnological process: metal bioleaching, anaerobic digestion, production of bioethanol and biodiesel, production of biohydrogen, food process biotechnology.

EST_403: Project Thesis

The student is required to undertake, under the supervision of professors of the Department, a thesis project. The subject of the project should be relevant to the main specialization of the student. The student is required to identify the subject and prepare a detailed research proposal. The student should collect and analyze research data and prepare and present the thesis.

LCE_660: Greek Language and Culture

LCE_104: English I for Academic Purposes

Spring Semester

EST_ 314: Toxicology II

Toxicology II course aims to introduce concepts such as biochemical toxicology, control, regulation and activity of metabolic enzymes. Molecular and cellular mechanisms of toxic action of substances. Mode of action and kinetics of cholinesterase inhibitors. Biochemical and molecular biomarkers at organism level. Effects of mixtures of chemicals to organisms and ecosystems. Toxicology II practical introduces the student to the toxicity testing methods and evaluation of results. The topics in the practical includes: Evaluation of toxicity using bioluminescence bacteria in water and soil samples Soil and sediment toxicity assessment. Evaluation of toxicity in water using the organisms such as *Daphnia magna*.

EST_ 403: Project Thesis

The student is required to undertake, under the supervision of professors of the Department, a thesis project. The subject of the project should be relevant to the main specialization of the student. The student is required to identify the subject and prepare a detailed research proposal. The student should collect and analyze research data and prepare and present the thesis.

LCE_660: Greek Language and Culture**LCE_104: English I for Academic Purposes**