WATER POLLUTION AND ENVIRONMENTAL EFFECTS

1	Course Title:	WATER POLLUTION AND ENVIRONMENTAL EFFECTS	
2	Course Code:	BYL4120	
3	Type of Course:	Optional	
4	Level of Course:	First Cycle	
5	Year of Study:	4	
6	Semester:	8	
7	ECTS Credits Allocated:	4.00	
8	Theoretical (hour/week):	2.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	None	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Doç. Dr. NURHAYAT DALKIRAN	
15	Course Lecturers:		
16	Contact information of the Course Coordinator:	Uludağ Üniversitesi Fen-Edebiyat Fakültesi Biyoloji Bölümü Görükle Kampüsü, Nilüfer/BURSA 16059 e-posta: dalkiran@uludag.edu.tr Telefon: 0 224 294 1866 Uludag University Faculty of Arts and Science Department of Biology Gorukle Campus, Nilufer/BURSA 16059 e-mail: dalkiran@uludag.edu.tr Phone: 0 224 294 1866	
17	Website:		
18	Objective of the Course:	The aim of the course is to provide to understanding of the causes and environmental effects of key types of water pollution. The goals are to teach the specific water pollutant types and their damage of ecosystem.	
19	Contribution of the Course to Professional Development:		
20	Learning Outcomes:		
		1	Obtains information about actual water pollution problems and their solutions.
		2	Defines the basic concepts of aquatic toxicology.
		3	Obtains information about water pollution types.
		4	Obtains information about the effects of water pollution on aquatic organisms and human being.
		5	Obtains information about the effects of water pollution on aquatic ecosystems.
		6	Understand the importance of the protection of water sources.
		7	Takes responsibility for the protection of water sources.
		8	
		9	
		10	
21	Course Content:		

	Course Content:	
Week	Theoretical	Practice
1	Introduction to water pollution in aquatic ecosystems; the reasons and types of water pollution; , Hydrologic cycle; The status and usage of water sources; some properties of water to support of life; The environmental legislations, acts, laws and formations related to water pollution in foreign countries and Turkey; Chronological development of environmental legislation in the World and Turkey;	
2	Aquatic toxicology; what is toxic matter and toxicity; general view of toxic pollutant types; Acute and chronic toxicity; Lethal and effective concentrations; the sensibility of organisms to toxic matters; additive, antagonistic and synergic effects of toxic matters; environmental factors to effects the toxicity; the transformation of toxic matters; bioaccumulation, bioconcentration and biomagnifications;	
3	Heavy metals; the types toxic heavy metals; the toxicity (acute, chronic) of heavy metals; mercury, cadmium and lead venenation; Minamata syndrome and ouch-ouch sickness; the biomagnification of mercury; the impacts of heavy metals to human health and aquatic organisms; the toxicity of copper, zinc, and	
	biodegradable organic pollutants); Persistent Organic Pollutants (POPs) and effect on	
	Hydrocarbons (CHCs) and derivatives; the bioaccumulations and toxic effects of CHCs;	
	impacts of POPs to human health and aquatic organisms;	
	and toxicity of pesticides; the transfer of pesticides in food chain; the bioaccumulation	
	receiving water environments; DDT and DDT like pesticides; Biomagnification of DDT;	
6	depletion of subjects	
	decomposers (bacteria fungi, slime molds, earthworms); types, origin and importance of organic pollutants in aquatic ecosystems; t he sewage types lead to organic pollution in water bodies; microbial pollution in water bodies; transmission of waterborne diseases;	
8	The definition and types of eutrophication; The impact of eutrophication to aquatic ecosystems; the sources of eutrophication; eutrophication and algal toxins; The effects of sedimentation in aquatic ecosystems; The effects of water pollution to agriculture;	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	2.00	28.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	3.00	42.00
Homeworks	1	10.00	10.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	15.00	15.00
Others	0	0.00	0.00
Final Exams	1	20.00	20.00
Total Work Load			130.00
Total work load/ 30hr			3.83
ECTS Credit of the Course			4.00

9	Oil pollution; importance oil pollution catastrophes in seas; some importance oil accidents at Istanbul Bosporus; the impacts of oil pollution to human health, aquatic organisms and aquatic ecosystems; the impacts of oil pollution to tourism, fisheries and economy; the clean up oil spill in oceans and seas;	
10	The impact of thermal pollution on aquatic organisms and ecosystems; the reasons and effects of thermal pollution; thermal pollution resources (nuclear power plants, hydroelectric plants, sewages etc.) thermal shock;	
11	The effects of nuclear pollution in aquatic ecosystems; the effects of radiation on organisms; Examples; Chernobil and Fukhushima catastrophes;	
12	Wastewater treatment	
13	The effects of air pollution to aquatic ecosystems; The damage of acid rains in aquatic ecosystems;	
14	The protection of water sources; Rapid Bioassessment Techniques, Monitoring studies, biomonitoring; The effects of water pollution to diversity and species richness of aquatic organisms; Bioindicator species and relation to water pollution.	

22	Textbooks, References and/or Other Materials:	Burk A.R. (Ed) (2005). Water pollution: new research. Nova Science Publishers. Akman, Y. A. Düzenli ve F. Geven (1996). Çevre Kirliliği ve Ekolojik Etkileri,

23 Assesment

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	1	30.00
Quiz	0	0.00
Home work-project	1	10.00
Final Exam	1	60.00
Total	3	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		

24 **ECTS / WORK LOAD TABLE**

25 **CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS**

	PQ1	**PQ2**	**PQ3**	**PQ4**	**PQ5**	**PQ6**	**PQ7**	**PQ8**	**PQ9**	**PQ10**	**PQ11**	**PQ12**	**PQ13**	**PQ14**	**PQ15**	**PQ16**
ÖK1	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0
ÖK2	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0

ÖK3	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0
ÖK4	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0
ÖK5	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0
ÖK6	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0
ÖK7	0	0	0	0	0	5	0	0	0	0	0	5	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications

Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**