WATER POLLUTION AND ENVIRONMENTAL EFFECTS

1	Course Title:	WATER POLLUTION AND ENVIRONMENTAL EFFECTS	
2	Course Code:	BYL0520	
3	Type of Course:	Optional	
4	Level of Course:	First Cycle	
5	Year of Study:	2	
6	Semester:	3	
7	ECTS Credits Allocated:	3.00	
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:	Bursa Uludağ Üniversitesi Fen-Edebiyat Fakültesi Biyoloji Bölümü Görükle Kampüsü, Nilüfer/BURSA 16059 e-posta: dalkiran@uludag.edu.tr Telefon: 0 224 2941866 Bursa Uludag University Faculty of Arts and Science Department of Biology Gorukle Campus, Nilufer/BURSA 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:	Learns the basic concepts and the relationships between water pollution, environment, aquatic organisms, and humans	
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	
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		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; Environmental legislations, acts and laws	
2	Introduction to aquatic toxicology; Acute and chronic toxicity; Lethal and effective concentrations; additive, antagonistic and synergic effects of toxic matters; bioaccumulation of toxic matters	
3	Heavy metals; the types toxic heavy metals; the toxicity (acute, chronic) of heavy metals; mercury, cadmium and lead venenation; the biomagnification of mercury; the impacts heavy metals to human health and aquatic organisms;	
4	Organic pollution; general view of organic pollutants types (Persistent and biodegradable organic pollutants); Persistent Organic Pollutants (POPs) and effect on aquatic ecosystems;	
5	The types of biocide and pesticide; the damage and toxicity of pesticides; the transfer of pesticides in food chain; the bioaccumulation of pesticides;	
6	DDT and DDT like pesticides; Biomagnification of DDT; the effects on aquatic organisms in nature; pesticide resistance;	
7	repetition of subjects	
8	Biodegradation of organic pollutants; organic pollution decomposers; microbial pollution in water bodies; transmission of waterborne diseases;	
9	The definition and types of eutrophication; The impact of eutrophication to aquatic ecosystems; the sources of eutrophication; The effects of sedimentation in aquatic ecosystems; The effects of water pollution to agriculture;	
10	Oil pollution; importance oil pollution catastrophes in seas; the impacts of oil pollution to human health, aquatic organisms and aquatic ecosystems; the clean up oil spill in oceans and seas;	
11	The impact of thermal pollution on aquatic organisms and ecosystems; the reasons and effects of thermal pollution; thermal pollution resources; thermal shock;	
12	The effects of nuclear pollution in aquatic ecosystems; the effects of radiation on organisms; Examples; Chernobil and Fukhushima catastrophes;	
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		Student attendance and participation, homework, written exam

24 ECTS / WORK LOAD TABLE

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	2.00	28.00
Homeworks	1	5.00	5.00
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	15.00	15.00
Total Work Load			91.00
Total work load/ 30 hr			3.03
ECTS Credit of the Course			3.00

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	0	0	3	3	0	0	0	0	0	0	0
ÖK2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK5	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0

ÖK6	0	0	0	0	0	3	0	3	3	0	0	0	0	0	0	0
ÖK7	0	0	0	0	0	4	0	5	0	0	0	0	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications

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