



## AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Biology of Freshwater Pollution							
Course Code		BİO644		Course Level		Third Cycle (Doctorate Degree)			
ECTS Credit	7	Workload	172 (Hours)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		Understanding pollution of freshwaters, their kinds, biological effects and experimental management methods. Varieties of pollution in waste waters and understanding problems created by it. Water pollution effect on biological life. Biological methods in order to identify pollution. Controlling methods of freshwater pollution							
Course Content		In General, The course content covers the water pollution as a result of human activities such as toxic, organic, sewage wastes and their effect on aquatic organisms. Also, the use of aquatic organisms for determination of degree of pollution and its methods as well as EU water framework directives.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Discussion, Individual Study					
Name of Lecturer(s)									

### Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	60
Term Assignment	1	10

### Recommended or Required Reading

1	C.F. Mason. 1991. Biology of freshwater pollution. pp. 1-351. Longman scientific & Technical
2	R. M. Harrison. 1992. Pollution: causes, effects and control. Royal society of chemistry. pp. 1-393
3	Other course books and internet

Week	Weekly Detailed Course Contents	
1	Theoretical	Freshwater pollution and an ecological approach
2	Theoretical	Toxicology in freshwaters: Kinds of toxic pollutants, environmental factors affecting toxicity, Tolerance, accumulation, field studies of toxic pollutants
3	Theoretical	Organic pollution: Sources of organic pollution, pathogens, sewage wastes, effecting mechanisms of Organic pollutants on clean systems
4	Theoretical	Eutrophication: sources of nutrients, eutrophication problems for human and its sociological effect, experiments on lakes, modelling eutrophication, controlling eutrophication
5	Theoretical	Acidification: sources of acidification, short and long term changes, experimental presentation and neutralisation of acidification effect
6	Theoretical	Heavy metals and organochlorides
7	Theoretical	Thermal pollution: its effect on environment, biota and example of Chernobyl
8	Theoretical	Radioactivity: sources of radioactivity, Biological effect, beneficial use of thermal waste
9	Intermediate Exam	Mid Term Examination
10	Theoretical	Lipids: its effect on environment Biota, field observations, Biological degradation and cleaning
11	Theoretical	Biological observation of water quality: sampling methods, choosing organisms for biological monitoring, Using big invertebrates for water quality.
12	Theoretical	Microorganisms and pollution: Bacteria nad virusus, biocollectors, experiments
13	Theoretical	Managements of water resources: water quality standards, river management, Fishing, protecting wild life
14	Theoretical	EC water quality directives
15	Theoretical	Indicator organisms in aquatic systems
16	Final Exam	Final examination

### Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	3	3	84
Assignment	5	4	2	30



Reading	14	2	1	42
Midterm Examination	1	6	2	8
Final Examination	1	6	2	8
Total Workload (Hours)				172
[Total Workload (Hours) / 25*] = <b>ECTS</b>				7
*25 hour workload is accepted as 1 ECTS				

### Learning Outcomes

1	To have the ability to separate kinds of water pollution and knowledge about water pollution
2	To learn how to use biological organisms in determining water pollution
3	
4	To learn the relationship between water pollution and wild life
5	

### Programme Outcomes (Biology Doctorate)

1	To have enough scientific background knowledge towards a specific study and research area
2	To have an ability to identify, evaluate and develop a solution for a problem on biological aspects
3	To be able to evaluate scientific observations and results of experiments using statistical analysis methods
4	To have basic skills in areas related to field of biological studies
5	To have the ability to develop cooperation with different disciplines with the high level of social communication required for studies
6	To have knowledge of technology and use of methods and means used in biological researches
7	To have an ethical understanding which will be a guide for their investigations and publications
8	For PhD; to have European Language Portfolio C1 general level language skill
9	To be able to present and discuss own research results in accordance with scientific discipline using technological tools in scientific research environments
10	To be able to detect and evaluate economic and social impacts of an own original research results
11	To be equipped with ability of carrying out independent study in biological field
12	To be able to publish at least one an international/national peer reviewed scientific paper and/or produce or interpret an original work related to biology in order to expand the frontiers of knowledge
13	To be able to develop new approaches or adaptations to be used in solving scientific and biological problems
14	To be able to develop new understanding and approaches in order to explain a new phenomenon or a biological event under investigation
15	To have abilities and experience to create new search area through inspiration gained from subject searched

### Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1	L2	L3	L4	L5
P5					2
P6		4	4		
P11	4				
P13				3	

