Zachodniopomorski Uniwersytet Technologiczny w Szczecinie

Faculty of Food Sciences and Fisheries

Field of study	Aquaculture and Fisheries		
Mode of study	stationary	*Level*	first cycle
Graduate's qualification	inżynier		
Fields of science	agricultural sciences		
Disciplines of science	animal science and fisheries (100%)		
Educational profile	general academic		
Module			
Course unit	**Toxicology in aquaculture and fisheries**		
Code	WNOZIR/AQF/S1/		
Field of specialisation			
Administering faculty	Department of Toxicology, Dairy Technology and Food Storage		
ECTS	6.0	*ECTS (forms)*	6.0
Form of course credit	examination	*Language*	english
Electives		*Elective group*	

Form of instruction	*Cod*	*Semester*	*Hours*	*ECTS*	*Weight*	*Credit*
laboratory course	L	3	30	3.0	0.50	credits
lecture	W	3	30	3.0	0.50	examination

Leading teacher	Witczak Agata (Agata.Witczak@zut.edu.pl)
Other teachers	Ciemniak Artur (Artur.Ciemniak@zut.edu.pl)

Prerequisites

W-1	Knowledge base of chemistry, biochemistry, ecology and environmental chemistry

Module/course unit objectives

C-1	The transfer to the student basic knowledge of environmental toxicology and the use of test methods

Course content divided into various forms of instruction		*Number of hours*
T-L-1	Health and safety in the lab. presentation of work organization	2
T-L-2	Determination of LC50 selected toxic substances	4
T-L-3	Selected elements of the analysis methodology of ecotoxicological studies	4
T-L-4	Toxicity tests	4
T-L-5	qualitative and quantitative analysis of selected pollutants in environmental samples and biological materials (fish, seafood)	12
T-L-6	Presentation of works prepared in the form of multimedia presentations by students. Final exam	4
T-W-1	A review the basic toxicological principles of uptake, elimination, and accumulation to aquatic organisms.	6
T-W-2	The relationships between abiotic and biotic processes of aquatic environments and their effects on contaminant distribution and subsequent exposure, accumulation, and toxicity of xenobiotics in aquatic environments.	10
T-W-3	The current methods of assessing and modeling toxic responses in the aquatic environment.	4
T-W-4	The concept of risk assessment, its use to assess ecological risks resulting from aquatic pollution.	8
T-W-5	New pollution and the threat to aquatic organisms	2

Student workload - forms of activity		*Number of hours*
A-L-1	participation in classes	30
A-L-2	preparation for classes	15
A-L-3	preparation of audit work	20
A-L-4	consultations	10
A-L-5	preparing for the exams	15
A-W-1	participation in classes	30
A-W-2	the study of literature	30
A-W-3	consultations	10
A-W-4	preparing for the exam	20

Teaching methods / tools

Teaching methods / tools	
M-1	informative lecture
M-2	laboratory
M-3	Discussions

Evaluation methods (F - progressive, P - final)		
S-1	F	checking preparation for classes
S-2	F	final exam

Designed learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to Learning Outcomes for qualifications at PQF 6, 7 or 8	Reference to learning outcomes for qualifications at level 6 or 7 that enable acquiring engineering competences	Course objectives	Course content	Teaching methods	Evaluation methods
Knowledge							
AQF_1A_C09_W01 The student is able to define the basic concepts in the field of the aquatic ecotoxicology, is able to characterize the basic threats to the environment, can indicate methods to prevent its threats.	AQF_1A_W02	P6S_WG	P6S_WG	C-1	T-W-1 T-W-4 T-W-2 T-W-5 T-W-3	M-1 M-2 M-3	S-2
Skills							
AQF_1A_C09_U01 student can to use a knowledge of testing methods and the ability to assess sources of intoxication and risk assessment of water ecosystems	AQF_1A_U05 AQF_1A_U10	P6S_UO P6S_UU P6S_UW		C-1	T-L-1 T-L-4 T-L-2 T-L-5 T-L-3 T-L-6	M-2 M-3	S-1
Social competences							
AQF_1A_C09_K01 The student is creative, has a concern for self-education, taking care of effects of their work. The student follows the rules of professional ethics, he can work in a team, he is able to assume the role of leader	AQF_1A_K01 AQF_1A_K03	P6S_KK P6S_KO P6S_KR		C-1	T-L-1 T-W-1 T-L-6	M-1 M-2 M-3	S-1

Outcomes	Grade	Evaluation criterion
Knowledge		
AQF_1A_C09_W01	*2,0*	
	3,0	The student has to define and describe presented methods and problems
	3,5	
	4,0	
	4,5	
	5,0	
Skills		
AQF_1A_C09_U01	*2,0*	
	3,0	The student is able to search and present information and the results of their research with the skill of their effective analysis
	3,5	
	4,0	
	4,5	
	5,0	
Other social competences		
AQF_1A_C09_K01	*2,0*	
	3,0	The student meets the basic competence requirements
	3,5	
	4,0	
	4,5	
	5,0	

Required reading
1. Lam P., B. Richardson, R. Wu, Introduction to Ecotoxicology, Blackwell Science Ltd., London, 1999
2. Walker C.H., R.M. Sibly, S.P. Hopkin, D.B. Peakall, Principles of Ecotoxicology, CRC Press, 2012, 4th ed., ISBN 9781439862667
3. Aquatic Toxicology, 2011, JOURNAL

Supplementary reading
1. Environmental Toxicology and Chemistry, JOURNAL
2. Archiv of the Environmental Contamination and Toxicology, JOURNAL
3. Bulletin of the Environmental Toxicology; Ecotoxicology, JOURNAL