## Zachodniopomorski Uniwersytet Technologiczny w Szczecinie

		I	Faculty of F	ood Science	es and Fisherie	5			
Field of st	udy	Aqua	aculture and Fish	neries					
Mode of study		stati	stationary Level first cycle				÷		
Graduate'	s qualification	inży	nier			WNO	WNoZiR		
Fields of s	cience	agrio	cultural sciences						
Discipline	s of science	anin	nal science and f	isheries (100%)					
Education	al profile	aene	eral academic	(,					
Module		90							
Course un	i+	Dice	asses and treat	ment of aquatic	animals				
Codo				inent of aquatic					
Eiold of cn	acialization	VVINC	JZIII/AQI/31/						
Field of sp	ecialisation	Den	artment of Hydro	biology Ichthyold	av and Biotechnology				
Administe	ring faculty	of Re	eproduction						
ECTS		6.0		ECTS (forms)	6.0				
Form of co	ourse credit	examination		Language	english				
Electives				Elective group					
Form of in	struction	Cod	Semester	Hours	ECTS	Weight	Credit		
laboratory	, course	L	5	30	3.0	0.50	credits		
lecture		w	5	30	3.0	0.50	examination		
Leading to	acher	Lino	wska Angelika (a	ngelika linowska@					
Othor too	shore	LIIIO	WSKa Aligelika (a						
Prerequisi	tes								
VV-1	Basic knowledge o	20010	bgy and microbiolog	gy, basics of parasit	biogy.				
Module/co	urse unit objectiv	es	th the major nathe	gone of free living a	nd aquaticultura arganici	me Transfor of k	anuladaa ahaut		
C-1	I o introduce students with the major pathogens of free-living and aquaticulture organisms. Transfer of knowledge about disease prevention and economic losses in aquaculture, which are caused by different kind of pathogens.								
С-2	Developing theoretical and practical skills for students to collect and examine research material. Developing the skills of								
Courso co	ntont divided into	vario	y, marriada ana te				Number of hours		
T-I -1	Introduction to laboratory classes. Methods of collecting and fixing parasites								
T-L-2	Review of selected species of parasites from the Protozoa and Mikrosporidia taxa 4								
T-L-3	Systematic position, morphological structure and biology of Digenea.								
T-L-4	Systematic position, morphological structure and biology of Monogenea.								
T-L-5	Test on topics 1-4.	2							
T-L-6	Systematic position, morphological structure and biology of Cestoda.								
T-L-7	Systematic position, morphological structure and biology of Acanthocephala.								
T-L-8	Systematic position, morphological structure and biology of parasitic nematodes. 2								
1-L-9	Systematic position, morphological structure and biology of parasitic crustaceans. 2								
T-L-10	appropriate to the specific group of parasites.								
T-L-11	Practical identification of selected pathogens of aquatic organisms.								
T-L-12	Parasitological section of the aquatic vertebrate. 2								
T-W-1	Introduction. Definitions used in parasitology. The concept of disease state. Infectious, environmental and functional diseases of aquatic organisms.								
T-W-2	Organism defense mechanisms.								
T-W-3	Parasitism as a kind of coexistence between organisms.   1								
T-W-4	Pathogens of aquatic animals belonging to Protista, Myxozoa, Coelenterata, Digenea, Aspidogastrea, Didymozoidea, Nematoda, Acanthocephala, Mollusca, Hirudinea i Crustacea.								
T-W-5	Prevention and therapy of vertebrates in aquaculture. 2								
T-W-6	Diseases of aquatic organisms in international law. 1								
Student w	orkload - forms of	activ	rity				Number of hours		
A-L-1	Participation in laboratories 30								
A-L-2	Participation in consultations 20								

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Student wo	workload - forms of activity N							Nun	nber of	f hours	
A-L-3	Studyir	Studying scientific literature on current laboratories								20	
A-L-4	Prepara	Preparation for passing the laboratories								20	
A-W-1	Partcip	ation in	lectures								30
A-W-2	Particip	pation ir	n consultations								20
A-W-3	Studyir	ng scien	tific literature								20
A-W-4	Prepara	ation fo	r passing lectures								20
Teaching r	nethod	ls / tool	ls								
M-1	Lecture using multimedia techniques										
M-2	Didactic discussion										
M-3	Laboratory exercises										
M-4	Searching databases using computers										
Evaluation methods (F - progressive, P - final)											
S-1	F Ongoing control of the correctness of work during classes										
S-2	F	Assess	sessment of the performance of laboratory tasks related to the content of the program								
S-3	F	F Practical identification of selected species of pathogens of aquatic organisms									
S-4	F	F Partial test									
S-5	Р	Final w	ritten test								
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	<u>)</u>										
AQF_1A_C16_W01 A student lists and characterize the causes of selected diseases of aquatic organisms and describes selected disease entities. He is able to propose a diagnostic method suitable for a given type of disease.			AQF_1A_W10 AQF_1A_W12	P6S_WG		C-1	T-W-1 T-W-2 T-W-3	T-W-4 T-W-5 T-W-6	M-1 M-4	S-2 S-4 S-5	
Skills											
AQF_1A_C16_U01 A student understands and describes the relationship between the host organism, pathogen and the state of the aquatic environment or / and breeding conditions. He can update his knowledge, search for new, professional sources of information.			AQF_1A_U01 AQF_1A_U10 AQF_1A_U11	P6S_UW	P6S_UW	C-2	T-L-1 T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-L-7 T-L-8	T-L-9 T-L-10 T-L-11 T-L-12 T-W-1 T-W-4 T-W-5	M-2 M-3 M-4	S-1 S-2 S-3 S-4	
Social competences											
AQF_1A_C16_K01 A student is aware of the need to constantly expand and update knowledge using specialized sources. Is able to follow the rules in force in contact with animal pathogens.				AQF_1A_K01 AQF_1A_K04	P65_KK P65_KR		C-1 C-2	T-L-2 T-L-3 T-L-4 T-L-5 T-L-6 T-L-7 T-L-8 T-L-8 T-L-9	T-L-10 T-L-11 T-L-12 T-W-2 T-W-4 T-W-5 T-W-6	M-1 M-2 M-3 M-4	S-1 S-2 S-5
Outcom	Outcomes Grade Evaluation criterion							•			
Knowledge											
AQF_1A_C16_	W01	2,0	A student is not able to list the ca	auses of diseases o	f a selected aqu	atic organism,	he does	not knov	their dia	agnostic	features
		3,0	A student is able to list the cause	s of diseases of a s	selected aquatic	organism, he k	nows ba	sic techr	nics of the	eir identi	fication
		3,5									
		4,0									
		4,5									
	A student is able to list and characterize the causes of selected diseases of aquatic organisms. He knows the techniques used in the diagnostics of the health of aquatic organisms, is able to apply them and present the propose an appropriate method of prevention against selected pathogens.					e modern results.	He can				

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Skills					
AQF_1A_C16_U01	2,0	A student is unable to recognize selected pathogens that are the cause of diseases of aquatic organisms.			
	3,0	A student is able to recognize selected pathogens that are the cause of diseases of aquatic organisms.			
	3,5				
	4,0				
	4,5				
	5,0	A student is able to recognize selected pathogens that are the cause of diseases of aquatic organisms. He can classify them into the appropriate taxonomic group. He can define the disease symptoms of the selected orgism caused by the presence of a pathogen.			
Other social com	petenc	es			
AQF_1A_C16_K01	2,0	The student does not study the course content of the subject, can not present them.			
	3,0	The student is aware of and is able to update their knowledge about the subject matter.			
	3,5				
	4,0				
	4,5				
	5,0	The student is aware of and is able to update their knowledge about the subject matter. He knows and is able to use specialized sources of knowledge. He is able to follow the rules of working with animal pathogens.			
Required reading	1				
1. Williams H., Jone	s A., Pa	rasitic Worms of Fish, Taylor&Francis, London, 1994			

2. Egusa S., Infectious Diseases of Fish, Balkema, Rotterdam, 1992

3. Bush A., Fernandez J. C., Esch G. W., Seed J. R., Parasitism. The diversity and ecology of animal parasites., Cambridge University Press., Cambridge, 2002

#### Supplementary reading

1. Austin B., Austin D., Bacterial Fish Pathogens: disease in farmed and wild fish, Ellis Horwood Limited, England, 1987

2. Zaccone G., Perriere C., Mathis A., Kapoor B. G., Fish Defenses. Volume 2. Pathogens, Parasites and Predators., Science Publishers, New Hampshire, 2009