



WNoŻiR



<i>Field of study</i>		Aquaculture and Fisheries				
<i>Mode of study</i>		stationary	<i>Level</i>	first cycle		
<i>Graduate's qualification</i>		inżynier				
<i>Fields of science</i>		agricultural sciences				
<i>Disciplines of science</i>		animal science and fisheries (100%)				
<i>Educational profile</i>		general academic				
<i>Module</i>						
<i>Course unit</i>		Diseases of aquatic invertebrates				
<i>Code</i>		WNOZIR/AQF/S1/				
<i>Field of specialisation</i>						
<i>Administering faculty</i>		Department of Hydrobiology, Ichthyology and Biotechnology of Reproduction				
<i>ECTS</i>		5.0	<i>ECTS (forms)</i>	5.0		
<i>Form of course credit</i>		examination	<i>Language</i>	english		
<i>Electives</i>			<i>Elective group</i>			
<i>Form of instruction</i>	<i>Cod</i>	<i>Semester</i>	<i>Hours</i>	<i>ECTS</i>	<i>Weight</i>	<i>Credit</i>
lecturing course	A	6	20	2.0	0.30	credits
laboratory course	L	6	10	1.0	0.20	credits
lecture	W	6	30	2.0	0.50	examination
<i>Leading teacher</i>		Linowska Angelika (angelika.linowska@zut.edu.pl)				
<i>Other teachers</i>						
<i>Prerequisites</i>						
<i>W-1</i>	Basic knowledge of biology, hydrobiology and zoology.					
<i>Module/course unit objectives</i>						
<i>C-1</i>	To introduce students with the major pathogens of invertebrates of great economic importance. Transfer of knowledge about disease prevention and economic losses in aquaculture, which are caused by different kind of pathogens.					
<i>C-2</i>	Developing theoretical and practical skills for students to collect and examine research material. Developing the skills of organization of laboratory, individual and team work, observing the principles of work in contact with pathogens.					
<i>C-3</i>	Preparation and conducting of presentations on issues related to the occurrence of pathogens of aquatic invertebrates.					
<i>Course content divided into various forms of instruction</i>						<i>Number of hours</i>
<i>T-A-1</i>	Introduction to diseases of invertebrates.					2
<i>T-A-2</i>	Presentation and discussion of different groups of invertebrate pathogens, their biology, geographical distribution and economic importance.					18
<i>T-L-1</i>	Introduction to laboratory classes. Review of selected species of parasites of aquatic invertebrates.					4
<i>T-L-2</i>	Parasitological section of the mollusc					3
<i>T-L-3</i>	Parasitological section of the crustacean					3
<i>T-W-1</i>	Pathogens of various groups of invertebrates (oysters, mussels, scallops, cockles, clams, sea urchins, shrimps, lobsters, crabs, crayfishes).					26
<i>T-W-2</i>	Prevention and therapy of invertebrates and vertebrates in aquaculture.					2
<i>T-W-3</i>	Zoogeography of pathogens of aquatic invertebrates.					2
<i>Student workload - forms of activity</i>						<i>Number of hours</i>
<i>A-A-1</i>	Participation in auditories					20
<i>A-A-2</i>	Participation in consultations					10
<i>A-A-3</i>	Studying scientific literature					20
<i>A-A-4</i>	Preparation of material for current classes					10
<i>A-L-1</i>	Participation in laboratories					10
<i>A-L-2</i>	Participation in consultations					5
<i>A-L-3</i>	Studying scientific literature on current laboratories					10
<i>A-L-4</i>	Preparation for passing the laboratories					5
<i>A-W-1</i>	Participation in lectures					30
<i>A-W-2</i>	Participation in consultations.					10



Student workload - forms of activity		Number of hours
A-W-3	Studying scientific literature	10
A-W-4	Preparation for passing lectures	10

Teaching methods / tools	
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	Assessment of the performance of laboratory tasks related to the content of the program
S-3	F	Practical identification of selected species of pathogens of aquatic organisms
S-4	P	Final written 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
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Knowledge									
AQF_1A_C24_W01	A student lists and characterizes the causes of selected diseases of aquatic invertebrates. He is able to indicate the geographical distribution of pathogens and their economic importance.	AQF_1A_W10 AQF_1A_W12	P6S_WG		C-1 C-3	T-A-1 T-A-2 T-L-1	T-W-1 T-W-2 T-W-3	M-1 M-2 M-3 M-4	S-1 S-2 S-4

Skills									
AQF_1A_C24_U01	A student is able to apply diagnostic and preventive methods to protect people from diseases caused by aquatic food-borne pathogens. He can update his knowledge, search for new, professional sources of information.	AQF_1A_U01 AQF_1A_U05 AQF_1A_U23 AQF_1A_U25	P6S_UO P6S_UU P6S_UW	P6S_UW	C-1 C-2 C-3	T-A-1 T-A-2 T-L-1 T-L-2	T-L-3 T-W-1 T-W-2 T-W-3	M-1 M-2 M-3 M-4	S-1 S-2 S-3

Social competences									
AQF_1A_C24_K01	The student is aware of and is able to update their knowledge about the subject matter.	AQF_1A_K01	P6S_KK P6S_KR		C-1 C-2 C-3	T-A-1 T-A-2 T-L-1 T-L-2	T-L-3 T-W-1 T-W-2 T-W-3	M-1 M-2 M-3 M-4	S-1 S-2 S-4

Outcomes	Grade	Evaluation criterion
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Knowledge		
AQF_1A_C24_W01	2,0	A student is not able to list and briefly characterize the causes of diseases of aquatic invertebrates, he does not know their geographical distribution.
	3,0	A student is able to list and briefly characterize the causes of few diseases of aquatic invertebrates, he can indicate their geographical distribution.
	3,5	
	4,0	
	4,5	
	5,0	A student is able to list and precisely characterize the causes of various diseases of aquatic invertebrates. He can indicate their geographical distribution. He can indicate their economic importance and propose an appropriate method of prevention against selected pathogens.

Skills		
AQF_1A_C24_U01	2,0	A student is not able to recognize a few diseases of aquatic invertebrates. He can't apply diagnostic and preventive methods to protect people from diseases caused by aquatic food-borne pathogens.
	3,0	A student is able to recognize a few diseases of aquatic invertebrates. He can apply a small number of diagnostic and preventive methods to protect people from diseases caused by aquatic food-borne pathogens.
	3,5	
	4,0	
	4,5	
	5,0	A student is able to recognize various diseases of aquatic invertebrates. He can apply a diagnostic and preventive methods to protect people from diseases caused by aquatic food-borne pathogens. He can update his knowledge, search for new, professional sources of information.

Other social competences		
AQF_1A_C24_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	A student is aware of the risks associated with the presence of pathogens in aquatic invertebrates used in aquaculture. He is aware of the need to constantly expand and update knowledge using specialized sources.



Required reading

1. Rohde K., Marine Parasitology, CSIRO Publishing, Collingwood, 2002

2. Lucas J. S., Southgate P. C., Tucker C. S., Aquaculture. Farming Aquatic Animals and Plants, John Wiley & Sons Ltd., Chichester, UK, 2019

Supplementary reading

1. Sindermann C. J., Lightner D. V., Disease Diagnosis and Control in North American Marine Aquaculture, Elsevier Science Publishers, The Netherlands, 1988