



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		Technological properties and safety of aquatic food products					
Code		WNOZIR/AQF/S1/					
Field of specialisation							
Administering faculty		Department of Hydrobiology, Ichthyology and Biotechnology of Reproduction					
ECTS		5.0	ECTS (forms)	5.0			
Form of course credit		examination	Language	english			
Electives			Elective group				
Form of instruction		Cod	Semester	Hours	ECTS	Weight	Credit
laboratory course		L	7	30	2.0	0.50	credits
lecture		W	7	30	3.0	0.50	examination
Leading teacher		Więcaszek Beata (Beata.Wiecaszek@zut.edu.pl)					
Other teachers		Linowska Angelika (angelika.linowska@zut.edu.pl)					
Prerequisites							
W-1		Basic knowledge of biology, hydrobiology, zoology and biochemistry.					
Module/course unit objectives							
C-1		Transfer of knowledge, skills and competences regarding parasitological hazards associated with the production of aquatic food.					
C-2		Transfer of knowledge, skills and competences in the area of geographical spread, influence of climatic factors, transport routes as well as ways and methods of preventing food parasites.					
C-3		Recognition of technological properties of raw materials and seafood products					
Course content divided into various forms of instruction							Number of hours
T-L-1		Introduction to laboratory classes. Modern methods of detecting aquatic organisms parasites.					2
T-L-2		Review of selected food pathogens of aquatic origin, dangerous to human health.					8
T-L-3		Risk analysis of pathogen transmission in the food chain.					2
T-L-4		Practical detection of parasites in aquaculture products.					2
T-L-5		Final test.					1
T-L-6		Presentation of raw materials properties and final products from fish of genus <i>Acipenser</i> , <i>Sardina</i> and <i>Anguilla</i>					4
T-L-7		Practical presentation of raw material and its technological properties of representatives from family Cyprinidae, orders: Siluriformes and Salmoniformes					5
T-L-8		Presentation of raw materials and products of fish species from orders: Perciformes (with emphasis on Scombroidei) and Pleuronectiformes					4
T-L-9		Final test					2
T-W-1		Introduction to food safety. Geographical aspect in occurrence of food parasitosis.					2
T-W-2		The most important and most common species of parasites in food of aquatic origin.					9
T-W-3		International health. Aquaculture products as a potential source of danger to human health.					2
T-W-4		Imported aquaculture products as a potential source of pathogen transmission.					1
T-W-5		Aquatic food safety in international law.					1
T-W-6		Technological characteristic of raw materials and products obtained from cartilaginous fish (shark and skates) classis Chondrichthys					2
T-W-7		Sturgeons from <i>Acipenseriformes</i> order as a source of valuable raw material (flesh) and eggs (black caviar)					2
T-W-8		Technological characteristic of raw materials and products obtained from eel species (<i>Anguilliformes</i>), herrings (<i>Clupeiformes</i>) and salmon (<i>Salmoniformes</i>): flesh and eggs for white and red caviar; pro-health and potential hazard factors					2
T-W-9		Technological characteristic of raw material obtained from <i>Cypriniformes</i> and <i>Siluriformes</i>					2



Course content divided into various forms of instruction		Number of hours
T-W-10	Pro-health and potential hazards components in flesh from scombroid and order Tetracopterygii and order Perciformes and Pleuronectiformes. Technological characteristic of raw material of fish obtained from Perciformes and Pleuronectiformes.	3
T-W-11	Technological characteristic of raw material obtained from the Invertebrata type (crustaceans, bivalves, cephalopods)	4

Student workload - forms of activity		Number of hours
A-L-1	Participation in classes	30
A-L-2	Literature study	20
A-L-3	Consultations with tutor	10
A-W-1	Attendance in lectures	30
A-W-2	Consultation with lecturer	20
A-W-3	Own work - study literature, preparing for exam	40

Teaching methods / tools	
M-1	Lecture using multimedia techniques
M-2	Didactic discussion
M-3	Laboratory exercises with the use of scientific aids in the form of short films, illustrations, ready microscopic and macroscopic preparations; differentiation of the presented research material, independent performance of diagnostic procedures

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	Partial test
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_C26_W01 Student knows different species of aquatic animals which are the source of seafood products and knows also their technological properties	AQF_1A_W15	P6S_WG		C-1	T-L-6 T-W-6 T-W-8	T-W-10 T-W-11	M-1 M-2	S-1 S-3 S-4
AQF_1A_C26_W02 A student has knowledge of the ways of transmission and prevention of parasitic diseases, which have a source in aquaculture products. He is able to define the factors conditioning the development and reproduction of pathogens in the environment, sources of infection, routes of entry and spread of parasites.	AQF_1A_W10	P6S_WG		C-1 C-2	T-W-1 T-W-2 T-W-3	T-W-4 T-W-5	M-1 M-2	S-3 S-4

Skills								
AQF_1A_C26_U01 Students has the ability to recognize and describe the important raw materials obtained from aquatic animals	AQF_1A_U01	P6S_UW	P6S_UW	C-1 C-3	T-L-6 T-L-7	T-L-8	M-1 M-3	S-2 S-4
AQF_1A_C26_U02 A student has the ability to recognize selected diseases originating in aquaculture products. Is able to propose appropriate methods for diagnosis and prevention of these diseases.	AQF_1A_U23	P6S_UW		C-1 C-2	T-L-1 T-L-2 T-L-3 T-L-4	T-L-5 T-W-2 T-W-4 T-W-5	M-1 M-2 M-3	S-1 S-2 S-3

Social competences								
AQF_1A_C26_K01 A student is aware of parasitological threats caused by the selection of inadequate quality of raw material for aquatic food production. He is aware of the relationship between the conditions of preparation and parasitological hazards of prepared aquatic food, and thus the health of the consumer.	AQF_1A_K02	P6S_KO P6S_KR		C-1 C-2	T-L-1 T-L-2 T-L-3 T-L-4	T-W-1 T-W-3 T-W-4 T-W-5	M-1 M-2 M-3	S-1 S-2 S-3 S-4
AQF_1A_C26_K02 Student can determine the technological properties of important sea food products	AQF_1A_K03	P6S_KO P6S_KR		C-2	T-L-6 T-L-7	T-L-8	M-1 M-3	S-1 S-4

Outcomes	Grade	Evaluation criterion
Knowledge		



Knowledge

AQF_1A_C26_W01	2,0	
	3,0	Student has a minimum knowledge of different species of aquatic animals which are the source of seafood products and knows also their the most important technological properties
	3,5	
	4,0	
	4,5	
	5,0	
AQF_1A_C26_W02	2,0	A student is not able to list the aquatic food born diseases, he does not know their diagnostic features and identification methods. He can't point out the ways these diseases spread.
	3,0	A student is able to list and generally discuss a few aquatic food born diseases. He is able to list the transmission ways of individual aquatic food born diseases, but he cannot indicate appropriate prevention methods.
	3,5	
	4,0	
	4,5	
	5,0	A student is able to list and in detail characterize selected aquatic food born diseases. He is able to list and characterize the transmission ways of individual aquatic food born diseases. He can conclude on the need to use preventive methods based on knowledge of local and international law.

Skills

AQF_1A_C26_U01	2,0	
	3,0	Students has the ability to recognize and describe the most important raw materials obtained from aquatic animals
	3,5	
	4,0	
	4,5	
	5,0	
AQF_1A_C26_U02	2,0	A student can not recognize aquatic food born diseases. He can not use of any methods of determining the organisms responsible this diseases.
	3,0	A student knows the correct naming and methods of determination only selected parasites, has difficulties with the use of an appropriate method of identification
	3,5	
	4,0	
	4,5	
	5,0	A student knows the correct naming and methods of determination most of selected parasites. Has can use an appropriate method of identification.

Other social competences

AQF_1A_C26_K01	2,0	A student does not show the need to acquire knowledge and skills to protect people from awuatic food born diseases.
	3,0	A student does not know all the risks arising from the presence of certain parasites in aquatic food, but he is aware of the responsibility for preparing food safe for the consumer.
	3,5	
	4,0	
	4,5	
	5,0	A student knows the numerous threats arising from the presence of certain parasites in aquatic food. He is aware of the responsibility for preparing food safe for the consumer. It places great emphasis on the use of good practice in the production of food from aquaculture.
AQF_1A_C26_K02	2,0	
	3,0	Student can determine the technological properties of at least 50% of presented materials
	3,5	
	4,0	
	4,5	
	5,0	

Required reading

1. Yearsley G.K., Last P.R., Ward D., Seafood Handbook, CSIRO Marine Research, Australia, 1999
2. Murrell K. D., Fried B., Food-borne Parasitic Zoonoses. Fish and Plant-Borne Parasites., Springer, USA, 2007

Supplementary reading

1. Halstead B.W, Auerbach P.S., Campbell D., Atlas of dangerous marine animals, CRC Press, Inc. Boca Raton, Florida, 1999
2. Soares N. F., Martins C. M. A., Vicente A. A., Food Safety in the Seafood Industry. A practical guide for ISO 22000 and FSSC 22000 implementation, WILEY Blackwell, UK, 2016