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	**Bioinformatics**		
Code	WNOZIR/AQF/S1/		
Field of specialisation			
Administering faculty	Department of Meat Technology		
ECTS	6.0	*ECTS (forms)*	6.0
Form of course credit	examination	*Language*	english
Electives	8	*Elective group*	

WNoŻiR

Form of instruction	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 teacher	Panicz Remigiusz (rpanicz@zut.edu.pl)
Other teachers	

Prerequisites	
W-1	Basics of genetics, statistics

Module/course unit objectives	
C-1	This this course is to introduce students to the new field of bioinformatics. Students will focus on comparison methods and algorithms used to analyse and visualize various data obtained from molecular studies.

Course content divided into various forms of instruction		Number of hours
T-L-1	Types of molecular data	2
T-L-2	GenBank structure and data submission	3
T-L-3	Indexing and screeaning of sequence databases	3
T-L-4	DNA and protein motif discovery	4
T-L-5	Assesment of genetic diversity	6
T-L-6	Primer design	5
T-L-7	Quality check of Sanger sequencing reads	4
T-L-8	Distance trees for data presentation	3
T-W-1	Introduction to Bioinformatics	2
T-W-2	Sources of nucleotide and protein data	2
T-W-3	Sequence alignment algorithms	3
T-W-4	Variability of genetic data	4
T-W-5	Types of molecular data (codominant, binary)	4
T-W-6	Protein sequence analysis	4
T-W-7	Next Generation Seqencing (platforms, techniques, aplications)	4
T-W-8	Molecular phylogenetics and evolution approaches	4
T-W-9	Protein families	3

Student workload - forms of activity		Number of hours
A-L-1	PC classess	30
A-L-2	Independent study (literature review)	30
A-L-3	Preparing for exam	30
A-W-1	Lecture	30
A-W-2	Independent study (literature review)	30
A-W-3	Preparing for exams	30

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Teaching methods / tools	
M-1	Lectures and practical PC exercises

Evaluation methods (F - progressive, P - final)		
S-1	F	practical test
S-2	P	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								
AQF_1A_C20b_W01 Student has knowledge in bioinformatics, including statistical calculations useful for solving tasks connected with the scope of the subject.	AQF_1A_W06	P6S_WG		C-1	T-W-1 T-W-2 T-W-3 T-W-4 T-W-5	T-W-6 T-W-7 T-W-8 T-W-9	M-1	S-1 S-2
Skills								
AQF_1A_C20b_U01 Student is able to plan and conduct process biological data as well as to interpret the obtained results and draw the conclusions	AQF_1A_U07 AQF_1A_U08	P6S_UW	P6S_UW	C-1	T-L-1 T-L-2 T-L-3 T-L-4	T-L-5 T-L-6 T-L-7 T-L-8	M-1	S-1 S-2
Social competences								
AQF_1A_C20b_K01 Student is able to work in a group and perform as a group leader; he/she is able to estimate the time necessary to accomplish the assigned tasks.	AQF_1A_K01	P6S_KK P6S_KR		C-1	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-W-1	T-W-2 T-W-3 T-W-4 T-W-5 T-W-6 T-W-7 T-W-8 T-W-9	M-1	S-1 S-2

Outcomes	Grade	Evaluation criterion
Knowledge		
AQF_1A_C20b_W01	2,0	
	3,0	Student demonstrates basic knowledge of biological data management and processing
	3,5	
	4,0	
	4,5	
	5,0	
Skills		
AQF_1A_C20b_U01	2,0	
	3,0	Student can solve basic problems associated with bioinformatic calculations
	3,5	
	4,0	
	4,5	
	5,0	
Other social competences		
AQF_1A_C20b_K01	2,0	
	3,0	Student is able to finish all tasks during course with the help of the colleagues and a teacher.
	3,5	
	4,0	
	4,5	
	5,0	

Required reading

1. Baxevanis A.D., Ouellette F., Bioinformatics. A practical guide to the analysis of genes and proteins., Oxford Journals, 2004

2. Hall B.G., Phylogenic trees made easy: a how to manual., Sinauer Associates Inc., US, 2007

3. Jones N.C., Pevzner P., An introduction to bioinformatics algorithms., MIT Press, 2004