Course name:

BIOINFORMATICS IN ANIMAL HUSBANDRY

ECTS	**3**
Course status	**obligatory**
Course final assessement/evaluation of outcomes	**exam**
Prerequisites	**passing the subject Genetics and Molecular Biology**

Main field of study:

BIOENGINEERING IN ANIMAL SCIENCE

Profile of study	**General-academic**
The code of studies (education level)	**SM (master)**
Semester of studies	**summer**
Language of instruction	**English**

Course offered by:

Name of faculty offering the course	**Faculty of Animal Sciences**
Name of department offering the course	**Department of Genetics, Animal Breeding and Ethology**
Course coordinator	**dr inż. Łukasz Migdał**

Learning outcomes of the course:

Symbol of outcome	Description of learning outcome	Reference to	
		main field of study outcomes	discipline#
KNOWLEDGE – student knows and/or understands:			
BIER_W01	methodology of experimental work allowing to design, perform and analyse of the results of experiments in the field of bioengineering and related fields	BIOI2_W01	RZ
BIER_W02	knows the rules for prepation of scientific publication and has the ability to use	BIOI2_W17	RZ
SKILLS – student is able to:			
BIER_U01	plan and perform experiment, analyze and interpret the results obtained, using	BIOI2_U01	RZ, PB
BIER_U02	skillfully select and modify techniques and technologies in order solutions to specific problems in the field of animal bioengineering and	BIOI2_U07	RZ
BIER_U03	use English in the fields of science and disciplines relevant to the field of study being studied, in accordance with	BIOI2_U11	RZ
SOCIAL COMPETENCE- student is ready to:			
BIER_K01	understands the need for systematic work on long-term implementation projects and is aware of the responsibility for the team's work results	BIOI2_K02	RZ

Teaching contents:

Lectures	10	hours

1. Bioinformatics databases - Major types of bioinformatics data – 1h

2. Dynamic programming (pair -wise sequences alignment) - 2h

3. PAM and BLOSUM matrices, multisequence aligment (MSA), Markov models - 2h

Topics of the lectures	4. FASTA and BLAST searching - 1h
	5. Protein Structures - 2h
	6. Introduction to Phylogenetics -1h
	7. Exam - 1h

Accomplished learning outcomes	*BIER_W01, BIER_U01, BIER_K01*
Verification methods, rules and criteria of outcome assessment	*Short question, multiple choice questions (25 - 22 points - 5.0; 21-20 - 4.5; 19-17 - 4.0; 16-15 - 3.5; 14-12 -3.0)*

Classes		**30**	**hours**

Topics of the classes	1.NCBI and ENSEMBL databases - BLAST options (2 lectures - 1,5h each - 3h)
	2.DNA - Genes, genes regulation, gene prediction and promoter prediction, polymorphisms analysis (6 lectures - 1,5h each - 9h)
	3. RNA - RNA structure prediction (2 lectures - 1,5h each - 3h)
	4. Proteins - structure, structure classification, prediction and visualization (7 lectures - 1,5h each - 10,5h)
	5 Phylogenetics (2 lectures - 1,5h each - 3h)
	6. Evaluation of laboratories - (1 lecture - 1,5h)

Accomplished learning outcomes	*BIER_W01, BIER_W02, BIER_U01,BIER_U02, BIER_U03, BIER_K01*
Verification methods, rules and criteria of outcome assessment	*two tests (70%) and student project evaluation(30%) - for every test there will be 5 works (5 points each) - (25 - 22 points - 5.0; 21-20 - 4.5; 19-17 - 4.0; 16-15 - 3.5; 14-12 -3.0)*

Seminars		**…**	**hours**

Topics of the seminars	

Accomplished learning outcomes	*symbol of learning outcomesof the seminars*
Verification methods, rules and criteria of outcome assessment	*together with participation in the final asessement (in %)*

References:

Basic	*Bioinformatics: Sequence and Genome Analysis, Mount, CSHLP 2004*
Supplementary	*Bioinformatics programmee instructions(available online)*

Structure of learning outcomes:

Dyscipline – animal science and fishery (RZ)	*3*	ECTS**
Discipline: # (*provide appripriate symbol - if the course relates to more than one academic discipline*)	*…*	ECTS**

Structure of student activities:

Contact hours		40	hours	1,6	ECTS**
including:	lectures	9	hours		
	classes and seminars	28,5	hours		
	consultations	…	hours		
	participation in research	…	hours		

	mandatory trainerships	…	hours		
	participation in examinations	2,50	hours		
e-learning		0	hours	0	ECTS[**]
student own work		35	hours	1,4	ECTS[**]

Syllabus valid from the academic year 2021/2022

* where 10 hours of classes = 1 ECTC (in case of 15 h → 2 ECTS)

** stated with an accuracy to 0.1 ECTS, where 1 ECTS = 25 - 30 hours of classes

\# academic discipline code: RZ - animal science and fishery, PB - biological sciences, etc.