

## Course Syllabus

### I. General Information

Course name	Bioinformatics
Programme	Biotechnology
Level of studies (BA, BSc, MA, MSc, long-cycle MA)	MSc
Form of studies (full-time, part-time)	part-time
Discipline	Biological sciences
Language of instruction	English

Course coordinator/person responsible	Dr hab. Maciej Mastyk
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Type of class ( <i>use only the types mentioned below</i> )	Number of teaching hours	Semester	ECTS Points
lecture	15	I	4
tutorial			
classes	15	I	
laboratory classes			
workshops			
seminar			
introductory seminar			
foreign language classes			
practical placement			
field work			
diploma laboratory			
translation classes			
study visit			

Course pre-requisites	<p>Knowledge of biochemistry, molecular biology, and the fundamental phenomena occurring in living cells.</p> <p>Basic knowledge from the field of informatics, ability to work at the computer and work with basic computer applications.</p>
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### II. Course Objectives

C1 - To familiarize students with available databases of biotechnology information
C2 - Make students aware of the benefits of the use of databases in practice
C3 - Presentation to students opportunities of the use of information available in the internet to achieve certain goals.
C4 - Theoretical knowledge about the nature of work and the use of bioinformatics resources
C5 - Education ability to move freely in databases, observations, ask questions and discuss the results of structural analysis of macromolecules
C6 - Practical use of the selected databases in the field of structural biology.
C7 - Acquisition of skills in specific vocabulary in the field of bioinformatics.

### III. Course learning outcomes with reference to programme learning outcomes

Symbol	Description of course learning outcome	Reference to programme learning outcome
<b>KNOWLEDGE</b>		
W_01	has deepened knowledge in terms of bioinformatics especially relevant for biotechnology as well as has knowledge of specialist computer tools	K_W04
<b>SKILLS</b>		
U_01	applies advanced techniques and research tools in bioinformatics	K_U01
U_02	uses bioinformatics methods to interpret natural processes	K_U04
<b>SOCIAL COMPETENCIES</b>		
K_01	is aware of the meaning, value, and need to analyse the processes from the field of biotechnology	K_K01

### IV. Course Content

Characteristics of Bioinformatics as a separate field of science, vocabulary and terminology in bioinformatics, databases, the NCBI data model, comparison and analysis of protein sequences using methods of predicting protein sequences, refer to databases of biotechnology information, genetics or structural biology. Knowing the basic file types used in the bioinformatics, analysis of nucleotide sequences of genes, analysis of the amino acid sequences of proteins, analysis of secondary and tertiary structures of proteins. Comparison of the nucleotide sequences of genes and amino acids of the proteins. Comparison of the tertiary structures of proteins. Modelling of homologous proteins.

### V. Didactic methods used and forms of assessment of learning outcomes

Symbol	Didactic methods (choose from the list)	Forms of assessment (choose from the list)	Documentation type (choose from the list)
<b>KNOWLEDGE</b>			
W_01	Conventional lecture	test	Evaluated test
<b>SKILLS</b>			
U_01	Classes	Checking practical skills /test	Evaluated test
U_02	Classes	Checking practical skills /test	Evaluated test
<b>SOCIAL COMPETENCIES</b>			
K_01	Classes	Checking practical skills /test	Evaluated test

### VI. Grading criteria, weighting factors.....

lecture and classes: evaluated test

Degree	Degree criteria	
<b>Very good (5)</b>	the student realizes the assumed learning outcomes to a very good degree	Student demonstrates knowledge of the content of education at the level of 91-100 %

<b>More than good (4,5)</b>	the student realizes the assumed learning outcomes to a more than good degree	Student demonstrates knowledge of the content of education at the level of 86-90 %
<b>good (4)</b>	the student realizes the assumed learning outcomes to a good degree	Student demonstrates knowledge of the content of education at the level of 71-85%
<b>Good enough (3,5)</b>	the student realizes the assumed learning outcomes to a good enough degree	Student demonstrates knowledge of the content of education at the level of 66-70%
<b>sufficient (3)</b>	the student realizes the assumed learning outcomes to a sufficient degree	Student demonstrates knowledge of the content of education at the level of 51-65%
<b>unsufficient (2)</b>	the student realizes the assumed learning outcomes to an unsufficient degree	Student demonstrates knowledge of the content of education at the level of 51%

#### VII. Student workload

Form of activity	Number of hours
Number of contact hours (with the teacher)	30
Number of hours of individual student work	70

#### VIII. Literature

Basic literature
Bioinformatics, pod red. A.D. Baxevanisa i B.F.F. Ouellette'a, PWN 2005