



Subject card

Subject name and code	Programming in Bioinformatics, PG_00058245						
Field of study	Biotechnology						
Date of commencement of studies	February 2023		Academic year of realisation of subject		2023/2024		
Education level	second-cycle studies		Subject group		Optional subject group		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Marek Wojciechowski				
	Teachers		dr hab. inż. Marek Wojciechowski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		5.0		15.0	50
Subject objectives	The purpose of this laboratory is to teach students solving various bioinformatics problems by writing short scripts in python programming language. Students learn the basics of Python language itself, but also get familiar with modules dedicated for solving advanced bioinformatics tasks.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_K04] is aware of the need to solve problems and perform tasks, independently formulate questions to solve a given problem or task; is able to plan the execution of a larger task by dividing it into partial tasks and draw up an appropriate schedule		Student is capable of analyzing a given problem and breaking it down into smaller, more manageable subtasks according to a specified schedule.		[SK3] Assessment of ability to organize work		
	[K7_U06] is able to apply statistical methods, computer solutions, especially bioinformatics methods to design experiments and technologies, analyze experimental results and technological processes and solve and technological processes and solve problems in the field of biotechnology, is able to use biotechnological databases		Student uses statistical and computational methods for designing experiments, analyzing results, and solving bioinformatics problems through independently prepared computer programs.		[SU4] Assessment of ability to use methods and tools		
	[K7_W04] has a structured knowledge of the application of informatics tools in biotechnology and molecular modeling of biomolecules		Student has knowledge of the application of programming tools, including specialized programming libraries, in biotechnology and molecular modeling of biomolecules		[SW3] Assessment of knowledge contained in written work and projects		

Subject contents	basics of python programming language		
	basics of numpy and matplotlib modules		
	usage of biopython library		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	practical test	60.0%	100.0%
Recommended reading	Basic literature	Essential Bioinformatics, Jin Xiong, 2006, Cambridge University Press	
		Learning Python, 3rd Edition, Mark Lutz, 2007, O'Reilly Media	
	Supplementary literature	Dive into python, http://www.diveintopython.net/	
	eResources addresses	Adresy na platformie eNauczanie: Programowanie w bioinformatyce - 2024 - Moodle ID: 30821 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30821	
Example issues/ example questions/ tasks being completed	Preparation of a script that automatically analyzes the structure of a given protein and presents the results in a concise form, both text and graphic		
	Preparation of a script automatically querring both structural and sequential databases and carrying out an automated comparative analysis between structures and sequences of protein		
Work placement	Not applicable		