

Subject card

Subject name and code	KNIME Analytics Platform, PG_00156240						
Field of study	Bioinformatics						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2025/2026		
Education level	Bachelor's studies		Subject group		Optional subject group		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		3.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Artur Mirocki				
	Teachers		dr Artur Mirocki				
Lesson types	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		0.0		45.0	75
Subject objectives	- Familiarizing students with issues related to the operation of the KNIME analytical platform, providing students with the possibilities and benefits of using the KNIME platform - Providing the necessary knowledge to enable data processing and presentation of results in the KNIME platform - Improving students' competences in working with data sets						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[BIOINL3_U01] Graduate is able to program using modern programming tools, including tools dedicated to bioinformatics		After completing the course, each student: can use most of the KNIME platform features presented in class, can navigate freely within the program window, and can independently create their own workflow using appropriate function blocks, can independently propose and implement a solution to a given problem using appropriate function blocks, can detect errors and propose solutions.		[SU2] presentation/project/paper/report [SU5] implementation of a problem task		
	[BIOINL3_W04] Has knowledge of basic research techniques and tools used in bioinformatics		After completing the course, each student: knows the general application of the KNIME platform and its operating principles, can list the basic functions of the KNIME platform, describe their operation, and describe their applications.		[SW2] presentation/project/paper/report		

Subject contents	Topics covered in laboratory classes: • Introduction to the general structure and principles of work in the KNIME analytical platform, • Basics of the KNIME environment, • Data processing and analysis using graphical methods (processes, function blocks, nodes, input/output ports, etc.), • Data structure - types of variables (vectors, lists, data frames, matrices) and operations on them (mathematical, statistical functions, etc.), • Data visualization methods (charts: scatter, bar, correlation matrix, etc.).		
Prerequisites and co-requisites	Prerequisites: • Knowledge of basic Python programming, matrix calculus (addition, subtraction, multiplication, transposition), and basic computer skills. Formal requirements: • Mathematical methods of bioinformatics - vector analysis		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	project	51.0%	100.0%
Recommended reading	Basic literature	1. used during classes • KNIME https://www.knime.com • KNIME Analytics Platform https://www.knime.com/knime-software/knime-analytics-platform • Thorsten Meinl, Bernd Jagla, Michael R. Berthold, Open Source Software in Life Science Research, Practical Solutions to Common Challenges in the Pharmaceutical Industry and Beyond, Woodhead Publishing Series in Biomedicine, 6- Integrated data analysis with KNIME, 2012, Pages 151-171 2. studied independently by the student • KNIME https://www.knime.com • KNIME Analytics Platform https://www.knime.com/knime-software/knime-analytics-platform • Oprogramowanie do samodzielnej pracy, dostępne na stronie: https://www.knime.com/downloads	
	Supplementary literature	• https://forum.knime.com/ • Oficjalny kanał na YouTube https://www.youtube.com/user/KNIMETV • https://www.knime.com/downloads	
	eResources addresses		
	Example issues/ example questions/ tasks being completed	Example issues: • Determining and interpreting descriptive statistics • Analyzing empirical distributions using graphical tools • Statistical inference • Application of selected significance tests • Graphical implementation of the analytical process • Visualization of multidimensional structures	
Work placement	Not applicable		

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