University of Gdańsk

Subject card

Subject name and code	Omics analysis in chemoinformatics, PG_00117813						
Field of study	Chemistry						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2026/2027			
Education level	Master's 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	English			
Semester of study	2		ECTS credits	2.0			
Learning profile	academic		Assessment form	credit			
Conducting unit	Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Karolina Jagiełło				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	30.0	0.0	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	Familiarizing the students with techniques of omics data analysis and their importance in predicting biological responses induce by stressor at the molecular level Introduction to available transcriptomic/ proteomic/metabolomic databases Curation and preprocessing of omics data. Advanced unsupervised and supervised method in omics data analysis Adverse Outcome Pathways the novel approach in selecting endpoints for chemoinformatic models						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[CHEMMU2_U05] Presents the results of research in the form of an independently written paper containing a description and justification of the purpose of the work, adopted methodology, results and their significance in comparison to other similar research.	At the end of the course every student: uses Python/R environment for omics data analysis and applying them for chemoinformatic models correctly interprets the results based on omics data	[SU2] presentation/project/paper/ report
[CHEMMU2_U04] Applies acquired knowledge of chemistry and related scientific disciplines.	At the end of the course every student: Knows advanced methods applied for omics data curation, preprocessing and analysis knows basic software packages to be used for omics data analysis	[SU2] presentation/project/paper/ report
[CHEMMU2_U06] Presents the results of scientific discoveries in chemistry and related disciplines in an understandable way.	At the end of the course every student: uses Python/R environment for omics data analysis and applying them for chemoinformatic models correctly interprets the results based on omics data	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report
[CHEMMU2_W11] Demonstrates general knowledge about the current trends in the development of chemistry as a science and the latest discoveries in this field.	At the end of the course every student: Knows advanced methods applied for omics data curation, preprocessing and analysis knows basic software packages to be used for omics data analysis	[SW2] presentation/project/paper/ report
[CHEMMU2_W04] Applies the acquired knowledge to an in-depth description of the properties of chemical connections, methods of their synthesis and analysis.	At the end of the course every student: is convinced that the use of omics data strengthens the predicting biological response induced by chemicals at the molecular level can critically evaluate experimental results and understand the necessity of their control understands the need of deeper learning in computational data analysis and developing predictive models	[SW1] oral statement/ conversation/discussion
[CHEMMU2_W03] Demonstrates extended knowledge in the field of modern measuring techniques used in chemical analysis.	At the end of the course every student: Knows advanced methods applied for omics data curation, preprocessing and analysis knows basic software packages to be used for omics data analysis	[SW1] oral statement/ conversation/discussion
[CHEMMU2_K04] Correctly identifies and resolves dilemmas related to the profession of a chemist.	At the end of the course every student: is convinced that the use of omics data strengthens the predicting biological response induced by chemicals at the molecular level can critically evaluate experimental results and understand the necessity of their control understands the need of deeper learning in computational data analysis and developing predictive models	[SK1] oral statement/conversation/ discussion [SK2] presentation/project/paper/ report

Subject contents

Introduction to available transcriptomic/proteomic/metabolomic databases, e.g., AOPWiki, GEO databases Curation and preprocessing of omics data. Advanced unsupervised and supervised method in omics data analysis Adverse Outcome Pathways the novel approach in selecting endpoints for chemoinformatic models Tools for determining doses induced perturbation in gene expression Predicting biological response induced by stressor at the molecular level

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written report for assigned project	51.0%	100.0%

Recommended reading

Basic literature	Scientific publications

	Supplementary literature	Scientific publications
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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