University of Gdańsk

Subject card

Subject name and code	Introduction to the Principles of Drug Design, PG_00117706						
Field of study	Chemistry						
Date of commencement of studies	October 2025		Academic year of realisation of subject	2025/2026			
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	Polish			
Semester of study	2		ECTS credits	1.0			
Learning profile	academic		Assessment form				
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	15.0	0.0	0.0	0.0	0.0	15
	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	15		2.0		8.0	25
Subject objectives	o familiarise students with issues related to the mechanisms of action of chemotherapeuticsTo familiarise students with the current state of knowledge on strategies and methods of designing new chemotherapeutic						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[CHEMMU2_W08] Demonstrates knowledge of theoretical computational and IT methods used to solve problems in chemistry.	After completing the course, each student: knows what are the basic mechanisms of action of chemotherapy drugs knows what designing new drugs is all about knows the basic computer methods used in drug design list the main challenges facing (Q)SAR methods;	[SW4] test/exam - oral or written
	[CHEMMU2_W06] Applies mathematics to the extent necessary to understand, describe and model chemical processes of medium complexity.	After completing the course, each student: knows what are the basic mechanisms of action of chemotherapy drugs knows what designing new drugs is all about knows the basic computer methods used in drug design list the main challenges facing (Q)SAR methods;	[SW4] test/exam - oral or written
	[CHEMMU2_W07] Selects experimental and theoretical techniques to the extent necessary to understand the description and modelling of medium complexity chemical processes.	After completing the course, each student: knows what are the basic mechanisms of action of chemotherapy drugs knows what designing new drugs is all about knows the basic computer methods used in drug design list the main challenges facing (Q)SAR methods;	[SW4] test/exam - oral or written
	[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.	After completing the course, each student: sees the benefits of using computer methods in context social (improving the quality of life of society), ethical (reducing the number tests carried out on animals) and economic (cost reduction research); understands the need for further education; demonstrates creativity in group work; shows responsibility for the work performed.	[SK1] oral statement/conversation/ discussion
	[CHEMMU2_W10] Uses knowledge of the principles of operation of the basic scientific and research apparatus used in chemistry.	After completing the course, each student: knows what are the basic mechanisms of action of chemotherapy drugs knows what designing new drugs is all about knows the basic computer methods used in drug design list the main challenges facing (Q)SAR methods;	[SW4] test/exam - oral or written
	[CHEMMU2_K06] Undertakes research tasks consciously and responsibly, understanding the social aspects of the practical application of the acquired knowledge and skills and the responsibility related to it.	After completing the course, each student: sees the benefits of using computer methods in context social (improving the quality of life of society), ethical (reducing the number tests carried out on animals) and economic (cost reduction research); understands the need for further education; demonstrates creativity in group work; shows responsibility for the work performed.	[SK1] oral statement/conversation/ discussion

Course outcome	Subject outcome	Method of verification
[CHEMMU2_U04] Applies acquired knowledge of chemistry and related scientific disciplines.	After completing the course, each student: can independently build a simple (Q)SAR model and carry it out correctly validate it and predict the dependent variable based on the value structure descriptors; critically verifies the obtained modeling results and is able to relate them to the currently applicable regulations.	[SU1] oral statement/conversation/ discussion
[CHEMMU2_U01] Plans and implements chemical experiments of medium complexity.	After completing the course, each student: can independently build a simple (Q)SAR model and carry it out correctly validate it and predict the dependent variable based on the value structure descriptors; critically verifies the obtained modeling results and is able to relate them to the currently applicable regulations.	[SU1] oral statement/conversation/ discussion
[CHEMMU2_U02] Critically assesses the results of conducted, performed observations and theoretical calculations and discusses errors.	After completing the course, each student: can independently build a simple (Q)SAR model and carry it out correctly validate it and predict the dependent variable based on the value structure descriptors; critically verifies the obtained modeling results and is able to relate them to the currently applicable regulations.	[SU1] oral statement/conversation/ discussion

Subject contents

Pathogen-host vs. system selective toxicityBiological activity and methods of testing itQuantitative ways of expressing biological activityMechanisms of drug action and strategies for searching for new chemotherapeutics (four eras in the history of drugs)Basics of designing new chemotherapeutics: stages of drug design, Lipski's Friday rule (RO5)Computer methods in the design of new drugs: Free-Wilson method, Hansch method, 3D-QSAR, etc.Economic aspects of drug design (pharmaceutical market analysi

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
egzam	51.0%	100.0%

Recommended reading

Basic literature	Scientific papers
Supplementary literature	Scientific papers
eResources addresses	

Example issues/ example questions/ tasks being completed

Work placement

Not applicable

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