GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Fundamentals of Pharmaceutical Chemistry and Technology, PG_00068100		
Field of study	Biomedical Engineering		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2027/2028
Education level	first-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	6	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Chemistry and Technology of Functional Materials -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Anna Schmidt	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	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	2.0	43.0	75

Subject objectives

Acquiring basic knowledge in the field of design, synthesis, production of pharmacologically active substances (API) and finished forms, mechanisms of action and analysis of pharmaceuticals

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U12] can analyze the operation of components, circuits and systems related to the field of study, as well as measure their parameters and examine technical specifications, and plan and conduct experiments related to the field of study, including computer simulations and measurements, and interpret obtained results and draw conclusions	The ability to assess the potential use of computer programs and artificial intelligence in research into new drugs.	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
[K6_W52] Knows and understands, to an advanced extent, selected aspects of chemistry and biochemistry, constituting general knowledge related to the field of study	Knowledge of procedures and principles applied in the design and manufacture of pharmacologically active substances.	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge

Subject contents

Course content – lecture
The origin of pharmacologically active substances. Searching for a lead compound and optimizing its structure. Designing pharmacologically active compounds. The theory of structural analogy. Modeling the relationship between the chemical structure of molecules and their biological activity. Conformational analysis. Combinatorial chemistry. Parallel synthesis. Split-and-mix method. Drug libraries. Current classification and nomenclature of medicinal substances. Technologies for obtaining selected pharmaceuticals. Quality assurance systems in the pharmaceutical industry. Analytical purity control. Drug forms and therapeutic systems.

Prerequisites and co-requisites

Knowledge of the fundamentals of chemistry, with particular emphasis on organic and analytical chemistry, as well as biochemistry

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Lecture: passing two tests	50.0%	50.0%
Laboratory: completion of all exercises	50.0%	50.0%

Recommended reading	Basic literature	1. G. L. Patrick, Medical Chemistry, WNT, 2003 2. A. Zejc, M. Gorczyca, Drug Chemistry, PZWL, 2004 3. G. L. Patrick, Chemistry of Drugs, Short Lectures series, WNT, 2004 4. M. Zając, E. Pawełczyk, A. Jelińska, Chemistry of Drugs, Karol Marcinkowski Medical University Press, Poznań, 2006 5. Polish Pharmacopoeia IV, V, VI, and XI (Warsaw, 1970, 1993, 2002, and 2017) 6. Kieć-Kononowicz, Selected Issues in the Search for and Obtaining of Medicinal Products, Jagiellonian University Press, Krakow, 2006
	Supplementary literature	R. B. Silverman, Organic Chemistry in Drug Design, WNT, 2004
	eResources addresses	Supplementary https://enauczanie.pg.edu.pl/moodle/ - Addresses on the eLearning platform:
Example issues/ example questions/ tasks being completed		
Practical activites within the subject	Not applicable	

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