GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	CHEMISTRY OF SYNTHETIC DRUGS, PG_00066139		
Field of study	Chemistry		
Date of commencement of studies	February 2025	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	Specialty 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	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Organic Chemistry -> Faculty of Chemistry -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Krystyna Dzierzbicka	
	Teachers	prof. dr hab. inż. Krystyna Dzierzbicka	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	30.0	0.0	0.0	45

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	45	5.0	25.0	75

Subject objectives

Overview of synthesis of selected drugs from different pharmacological groups.

Implementation of selected pharmaceutical preparations in accordance with *List of Preparations* containing a synthesis of single-stage, two-stage and multi-stage covering a variety of chemical processes for example: alkylation, acylation, nitration, sulfonation, esterification, oxidation, reduction.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U03] plans and performs the synthesis of chemical compounds with the required properties	Student planning stages of several organic synthesis drugs.	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
[K7_K04] is aware of the responsibility for decisions made, observing and developing the principles of professional ethics and working to ensure compliance with these principles	The student has knowledge of drug chemistry. The student is able to make appropriate decisions regarding both the design and synthesis of pharmaceutical compounds.	[SK5] Assessment of ability to solve problems that arise in practice [SK2] Assessment of progress of work [SK3] Assessment of ability to organize work
[K7_W01] recognizes problems of modern chemistry, including properties and obtaining chemical compounds, necessary for making calculations, including the dependence of the compound's structure and its reactivity	The student writes the correct synthetic names of drugs. The student identifies individual groups of drugs. The student classifies the mechanisms of organic reactions in the synthesis of pharmaceutical compounds.	[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects
[K7_U04] develops and transmits technical information in the form of text documents, spreadsheets, graphs, technological diagrams and multimedia presentations, and prepares a speech including a multimedia presentation	The student has extended knowledge in the field of medicinal chemistry, organic chemistry and chemical synthesis of multi-step pharmaceutical compounds. The student is able to use the acquired knowledge to design drug synthesis schemes.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools

<table>
<tr><td>Subject contents</td><td>1. Discussion syntheses of selected drugs the following pharmacological groups:

1.1. analgesics and antipyretics drugs

1.2. antiviral drugs

1.3. anticancer drugs

1.4. cardiac drugs and hypertension drugs

1.5. antidiabetic drugs

1.6. psychotropic drugs, hypnotics and sedatives drugs

1.7. immunosuppressive drugs</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Student should possess background of organic chemistry and basic English to read reviews and original articles.</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Implementation of the planned syntheses of drugs according to the list.</td><td>100.0%</td><td>50.0%</td></tr>
<tr><td>The meeting of 60% of points with three the lecture-colloquias.</td><td>100.0%</td><td>50.0%</td></tr>
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Recommended reading	Basic literature	1. H.X. Ding et. al. Synthetic approaches to the 2013 new drugs. *Bioorganic & Medicinal Chemistry*, 2015, *23*, 18951922. 2. Oryginalne artykuły z czasopism dotyczące zagadnień wykładowych podane na wykładzie, np. G.M. Keating *Drugs* 2014, *74*, 207. 3. K. Dzierzbicka, D. Witt, *Chemia leków syntetycznyc*h. Wydawnictwo Politechniki Gdańskiej, Gdańsk 2019. 4. C.G. Wermuth, *The Practice of Medicinal Chemistry*. Elsevier 2004. 5. A. Zejca, M. Gorczyca (Red.), *Chemia leków*, Wyd. lek. PZWL, Warszawa 2008. 6. J. McMurry, *Chemia Organiczna*, PWN, Warszawa 2005. 7. T.W. Graham Salomons, *Fundamentals of Organic Chemistry*, John Wiley & Sons, New York, 1990. 8. F.A. Carey, *Organic Chemistry,* McGraw-Hill, Inc. 2nd. ed., New York, 1992. 9. S. Biniecki, *Preparatyka środków leczniczych*. Podręcznik dla studentów farmacji. Warszawa PZWL 1983. 10. R.B. Silverman, *Chemia organiczna w projektowaniu leków*. Wydawnictwo Naukowo-Techniczne. Warszawa 2004. 11. T. Tkaczyński, D. Kaczyńska, *Synteza i Technologia Chemiczna Leków*. PZWL. Warszawa 1984. 12. J. Gawroński, K. Gawrońska, K. Kacprzak, M. Kwit, *Współczesna Synteza Organiczna.* Wybór eksperymentów, PWN, Warszawa 2004.
	Supplementary literature	1. J. McMurry, *Chemia Organiczna*, PWN, Warszawa 2005. 2. S. Biniecki, *Preparatyka środków leczniczych*. Podręcznik dla studentów farmacji. Warszawa PZWL 1983.
	eResources addresses	

Example issues/ example questions/ tasks being completed	Student performs the synthesis of drugs, e.g. aspirin, paracetamol, salol, benzocaine, propranolol, phenytoin, lidocaine, cholamide. Present the mechanism of the various stages of acetylsalicylic acid synthesis. Starting from benzene, introduce the next steps for obtaining sulfanilamide. Give the structural formulas of three antihypertensive drugs that are angiotensin receptor antagonists.
Work placement	Not applicable

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