



Subject card

Subject name and code	CHEMISTRY OF SYNTHETIC DRUGS, PG_00038903						
Field of study	Chemistry						
Date of commencement of studies	February 2022	Academic year of realisation of subject			2022/2023		
Education level	second-cycle 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			6.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Organic Chemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Krystyna Dzierzbicka					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	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	60		10.0		80.0	150
Subject objectives	Overview of synthesis of selected drugs from different pharmacological groups. Implementation of selected pharmaceutical preparations in accordance with <i>List of Preparations</i> 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_U01	The student can use the appropriate literature sources on the synthesis of drugs.			[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information		
	K7_W02	Student draws a correct structural formulas of drugs. Student identifies separate class of drugs. Student classifies organic reaction mechanisms in the synthesis of drugs.			[SW1] Assessment of factual knowledge		
	K7_U04	Student planning stages of several organic synthesis drugs.			[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools		
	K7_K01	The student has broadened knowledge in the field of drug chemistry, organic chemistry and synthesis of multi-stage organic compounds.			[SK5] Assessment of ability to solve problems that arise in practice [SK2] Assessment of progress of work		

Subject contents	<p>1. Acetylsalicylic acid and sulfonamides - historical, synthesis and application</p> <p>2. History of talidomide.</p> <p>3. Discussion syntheses of selected drugs the following pharmacological groups:</p> <p>3.1. analgesics and antipyretics drugs</p> <p>3.2. antiviral drugs</p> <p>3.3. anticancer drugs</p> <p>3.4. cardiac drugs</p> <p>3.5. antidiabetic drugs</p> <p>3.6. hypertension drugs</p> <p>3.7. hypnotics and sedatives drugs</p> <p>3.8. psychotropic drugs</p> <p>3.9. immunosuppressive drugs</p>											
Prerequisites and co-requisites	Student should possess background of organic chemistry and basic English to read reviews and original articles.											
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="456 1111 794 1137">Subject passing criteria</th> <th data-bbox="799 1111 1137 1137">Passing threshold</th> <th data-bbox="1142 1111 1481 1137">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 1144 794 1196">The meeting of 60% of points with three the lecture-colloquias.</td> <td data-bbox="799 1144 1137 1196">100.0%</td> <td data-bbox="1142 1144 1481 1196">50.0%</td> </tr> <tr> <td data-bbox="456 1202 794 1272">Implementation of the planned syntheses of drugs according to the list.</td> <td data-bbox="799 1202 1137 1272">100.0%</td> <td data-bbox="1142 1202 1481 1272">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	The meeting of 60% of points with three the lecture-colloquias.	100.0%	50.0%	Implementation of the planned syntheses of drugs according to the list.	100.0%	50.0%
Subject passing criteria	Passing threshold	Percentage of the final grade										
The meeting of 60% of points with three the lecture-colloquias.	100.0%	50.0%										
Implementation of the planned syntheses of drugs according to the list.	100.0%	50.0%										

Recommended reading	Basic literature	<p>1. H.X. Ding et. al. Synthetic approaches to the 2013 new drugs. <i>Bioorganic & Medicinal Chemistry</i>, 2015, 23, 1895–1922.</p> <p>2. Oryginalne artykuły z czasopism dotyczące zagadnień wykładowych podane na wykładzie, np. G.M. Keating <i>Drugs</i> 2014, 74, 207.</p> <p>3. K. Dzierzbicka, D. Witt, <i>Chemia leków syntetycznych</i>. Wydawnictwo Politechniki Gdańskiej, Gdańsk 2019.</p> <p>4. C.G. Wermuth, <i>The Practice of Medicinal Chemistry</i>. Elsevier 2004.</p> <p>5. A. Zejca, M. Gorczyca (Red.), <i>Chemia leków</i>, Wyd. lek. PZWL, Warszawa 2008.</p> <p>6. J. McMurry, <i>Chemia Organiczna</i>, PWN, Warszawa 2005.</p> <p>7. T.W. Graham Salomons, <i>Fundamentals of Organic Chemistry</i>, John Wiley & Sons, New York, 1990.</p> <p>8. F.A. Carey, <i>Organic Chemistry</i>, McGraw-Hill, Inc. 2nd. ed., New York, 1992.</p> <p>9. S. Biniński, <i>Preparatyka środków leczniczych</i>. Podręcznik dla studentów farmacji. Warszawa PZWL 1983.</p> <p>10. R.B. Silverman, <i>Chemia organiczna w projektowaniu leków</i>. Wydawnictwo Naukowo-Techniczne. Warszawa 2004.</p> <p>11. T. Tkaczyński, D. Kaczyńska, <i>Synteza i Technologia Chemiczna Leków</i>. PZWL. Warszawa 1984.</p> <p>12. J. Gawroński, K. Gawrońska, K. Kacprzak, M. Kwit, <i>Współczesna Synteza Organiczna. Wybór eksperymentów</i>, PWN, Warszawa 2004.</p>
	Supplementary literature	<p>1. J. McMurry, <i>Chemia Organiczna</i>, PWN, Warszawa 2005.</p> <p>2. S. Biniński, <i>Preparatyka środków leczniczych</i>. Podręcznik dla studentów farmacji. Warszawa PZWL 1983.</p>
	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. Give an example of asymmetric (<i>R</i>)-thalidomide 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