

Subject card

Subject name and code	Chemistry of Medicinal Substances, PG_00188302						
Field of study	Chemia substancji leczniczych (Ćw.laboratoryjne)						
Date of commencement of studies	October 2026		Academic year of realisation of subject			2027/2028	
Education level	Bachelor's studies		Subject group			Obligatory subject group in the field of study 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	2		Language of instruction			Polish	
Semester of study	3		ECTS credits			2.0	
Learning profile	academic		Assessment form			credit	
Conducting unit	Laboratory of Medical Chemistry -> Department of Biomedical Chemistry -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Marta Spodzieja				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	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 students with the basic methods of chemical synthesis of selected pharmaceutical compounds. Providing knowledge and practical skills in laboratory techniques at the micromolar scale, typical for organic and analytical chemistry. Developing the ability to independently plan experiments, perform elemental analyses, and determine the content of active substances in drugs. Cultivating skills in interpreting results, solving experimental problems, and working safely in accordance with laboratory hygiene and safety rules.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[AKRL3_U01] The graduate is able to identify, analyse and solve complex research problems in chemistry and forensic science by selecting appropriate methods and information sources.	The student is able to identify and analyze research problems related to the synthesis and analysis of drugs, select appropriate methods for synthesis, elemental analysis, and determination of active substance content, independently carry out laboratory experiments, and interpret results while ensuring the reliability and accuracy of the data.	[SU5] realizacja zadania problemowego [SU6] demonstracja umiejętności praktycznych [SU8] obserwacja samodzielnej lub zespołowej pracy studenta
	[AKRL3_W05] The graduate knows and understands toxicokinetic and toxicodynamic processes and the methods of identifying toxic substances in forensic contexts.	The student understands the processes of toxicokinetics and toxicodynamics and is able to identify toxic substances in a forensic context, using drug analysis methods and determination of active substance content in the laboratory.	[SW4] test/egzamin - ustny lub pisemny [SW5] realizacja zadania problemowego
	[AKRL3_K02] The graduate is ready to make reliable, objective decisions and take responsibility for the interpretation of research results.	The student is able to independently conduct a reliable assessment of research results, draw objective conclusions, and take responsibility for the accuracy of experimental data interpretation.	[SK5] realizacja zadania problemowego [SK6] demonstracja umiejętności praktycznych [SK8] obserwacja samodzielnej lub zespołowej pracy studenta
	[AKRL3_W07] The graduate knows and understands the principles of quality assurance in analytical and forensic laboratories.	The student knows and understands the principles of quality assurance in analytical and forensic laboratories and is able to apply them during drug synthesis, elemental analyses, and determination of active substance content, ensuring the reliability, reproducibility, and credibility of laboratory results.	[SW4] test/egzamin - ustny lub pisemny [SW5] realizacja zadania problemowego
	[AKRL3_K06] The graduate is ready to follow occupational health and safety regulations in the laboratory and care for the safety of themselves and others.	The student is able to follow laboratory health and safety rules and ensure their own safety as well as the safety of others while conducting laboratory experiments.	[SK5] realizacja zadania problemowego [SK6] demonstracja umiejętności praktycznych [SK8] obserwacja samodzielnej lub zespołowej pracy studenta
Subject contents	Preparation of selected simple pharmaceutical compounds. Identification of synthesis products and assessment of their purity. Identification of active pharmaceutical ingredients in unknown commercial simple drugs using classical chemical qualitative analysis methods. General methods for identifying pharmaceutical compounds belonging to selected structural groups, such as alkaloids, steroids, tetracyclines, sulfonamides, β-lactam compounds, aniline and salicylic acid derivatives, and barbiturates. Qualitative analysis of the active substance in a selected simple drug and quantitative determination of its content in a unit dose of a commercial single-component pharmaceutical product.		
Prerequisites and co-requisites	Completed courses in organic and general chemistry. Knowledge of the basics of calculations used in analytical chemistry. Knowledge of fundamental laboratory health and safety (H&S) rules. Ability to work with laboratory equipment, glassware, and basic apparatus used in chemical preparation and analysis.		

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Passing three written tests: one on the synthesis of a pharmaceutical compound, one on the qualitative analysis of organic substances, and one on the chemistry of selected reagents used in drug identification.	51.0%	90.0%
	Preparation and analysis of the results for each laboratory exercise (obtaining a positive grade on all reports is a prerequisite for passing the course).	51.0%	10.0%
Recommended reading	Basic literature	R. Kasprzykowska, F. Kasprzykowski , <i>Analiza jakościowa organicznych środków farmaceutycznych</i> , Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk. R. Kasprzykowska, F. Kasprzykowski , <i>Preparatyka organiczna środków farmaceutycznych</i> , Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk. R. Walczyna, J. Sokołowski, G. Kupryszewski , <i>Analiza związków organicznych</i> , Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 1996. R. Kasprzykowska, A.S. Kołodziejczyk , <i>Chemiczna analiza środków leczniczych. Leki proste</i> , Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk, 2009.	
	Supplementary literature	G.L. Patrick , <i>Chemia medyczna. Podstawowe zagadnienia</i> , Wydawnictwo Naukowe WNT, Warszawa, 2003. G.L. Patrick , <i>Krótkie wykłady. Chemia leków</i> , Wydawnictwo Naukowe PWN, Warszawa, 2004. R.B. Silverman , <i>Chemia organiczna w projektowaniu leków</i> , Wydawnictwo Naukowe WNT, Warszawa, 2004. Praca zbiorowa pod red. K. Kieć-Kononowicz , <i>Wybrane zagadnienia z metod poszukiwania i otrzymywania środków leczniczych</i> , Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków, 2006. Z. Markiewicz, Z.A. Kwiatkowski , <i>Bakterie, antybiotyki, lekooporność</i> , Wydawnictwo Naukowe PWN, Warszawa, 2001. A. Zgirski, R. Gondko , <i>Obliczenia biochemiczne</i> , Wydawnictwo Naukowe PWN, Warszawa, 1998. M. Zając, E. Pawełczyk , <i>Chemia leków</i> , Wydawnictwo Akademii Medycznej im. Karola Marcinkowskiego, Poznań, 2000. A. Zejca, M. Gorczyca , <i>Chemia leków</i> , Wydawnictwo PZWL, Warszawa, 2004.	
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Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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