

Subject card

Subject name and code	Monographic lecture - Modern methods of chemical synthesis, PG_00082498						
Field of study	Chemistry						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2027/2028		
Education level	Master's studies		Subject group		Obligatory subject group in the field of study Optional subject group		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		3.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Elżbieta Jankowska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	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		40.0	75
Subject objectives	Familiarizing students with: - basic rules of carrying organic synthesis - modern methods of organic synthesis, allowing the formation of new carbon-carbon and carbon-heteroatom bonds - modern techniques of organic synthesis, including asymmetric catalysis and multi-component reactions (for instance Mannich, Ugi, and Passerini reactions) - the concept of retrosynthesis Enabling students to acquire skills of designing multi-step syntheses of organic compounds						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[CHEMMU2_W05] Has extended knowledge in the field of the specialisation studied.	The student: - critically analyzes the possibility of application of a selected chemical reaction to obtain the desired product; - predicts expected side reactions that make it difficult to obtain the correct product from given substrates; - evaluates the risks associated with a given type of reaction and proposes ways to enable the safe carry out the desired transformations;	[SW1] oral statement/ conversation/discussion
	[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.	The student: - gets involved in a team work in solving project-type tasks; - discusses in a group the methods of solving synthetic problems; - presents the group's proposed solutions of synthetic problems	[SK1] oral statement/conversation/ discussion
	[CHEMMU2_W11] Demonstrates general knowledge about the current trends in the development of chemistry as a science and the latest discoveries in this field.	The student: - is familiar with modern methods of organic synthesis, allowing the formation in molecules new carbon-carbon and carbon-heteroatom bonds; - knows modern techniques of organic synthesis, such as asymmetric catalysis and multicomponent reactions (e.g., Mannich, Ugi, Passerini reaction)	[SW5] implementation of a problem task
	[CHEMMU2_W01] Uses knowledge of spectroscopic methods of chemical compound analysis.	The student: - predicts the structure of products, based on the structure of substrates and the applied reaction conditions	[SW5] implementation of a problem task
Subject contents	- creation of new carbon-carbon bonds using, inter alia, Heck reaction, Suzuki reaction, olefin metathesis, Michael reaction, Robinson annulation - creation of new carbon-heteroatom bonds using, inter alia, Sharpless, Jacobsen, Mitsunobu and Buchwald-Hartwig reactions - modern techniques of organic synthesis, including: asymmetric catalysis, multicomponent reactions (for instance Mannich, Ugi and Passerini reactions) - recognition of syntons in organic molecules, designing synthetic pathways for selected organic compounds		
Prerequisites and co-requisites	Completed course in "Organic Chemistry"		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	problem tasks	51.0%	100.0%
Recommended reading	Basic literature	J. Clayden, N. Greeves, S. Warren, Organic chemistry	
	Supplementary literature	G.S. Zweifel, M.H. Nantz, P. Somfai, Modern organic synthesis. An introduction. Wiley 2017	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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