



Subject card

Subject name and code	MODERN METHODS OF SYNTHESIS, PG_00053226						
Field of study	Chemistry						
Date of commencement of studies	February 2025	Academic year of realisation of subject			2024/2025		
Education level	second-cycle 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	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Organic Chemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Dariusz Witt					
	Teachers						
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	10.0		45.0	100	
Subject objectives	Students study the modern synthetic methods for preparation of organic compound. The possibility of coupling reactions based on the organic boron, tin, zinc, and silicon derivatives catalyzed by Pt, Pd, Cu and Ni complexes are discussed.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_W02	Student can recognize dangerous reactions and prevent unexpected accident. Student is able to assemble correctly apparatus for synthesis, distillation and crystallization. Student knows the precautions for safe work with chemicals			[SW3] Assessment of knowledge contained in written work and projects		
	K7_K04	Student is familiar with analytical techniques required for identification and structure analysis of organic compound.			[SK2] Assessment of progress of work		
	K7_K01	Student understands modern chemical transformations.			[SK2] Assessment of progress of work		
	K7_U02	Student is able to design conditions of experiment to accomplish task.			[SU1] Assessment of task fulfilment		
Subject contents	Carbon-Carbon Bond-Forming Reactions Based on the organoboranes, organosilanes, and organostannanes. The coupling reactions: Negishi, Sonogashira, and Buchwald-Hartwig cross coupling reaction.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	test	60.0%			50.0%		
	multistep synthesis	60.0%			50.0%		

Recommended reading	Basic literature	<p>1. F.A. Carey, R.J. Sundberg, Advanced Organic Chemistry</p> <p>2. J. Gawroński, K. Gawrońska, K. Kasprzak, M. Kwiit, Współczesna synteza organiczna, Wybór eksperymentów</p> <p>3. J. i K. Gawrońscy, Wybór ćwiczeń z zaawansowanej chemii organicznej</p> <p>4. A. I. Vogel, Preparatyka organiczna</p> <p>5. praca zbiorowa pod redakcją J. T. Wróbla, Preparatyka i elementy syntezy organicznej</p>
	Supplementary literature	<p>1. praca zbiorowa pod redakcją Bochwica, Preparatyka organiczna</p> <p>2. M. Mąkosza, Synteza organiczna</p> <p>3. D. Witt. K. Dzierzbicka, J. Rachoń, Ćwiczenia laboratoryjne z chemii organicznej</p> <p>4. A. Arendt, A. Kołodziejczyk, T. Sokołowska, Ćwiczenia laboratoryjne z chemii organicznej</p>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<p>1. Starting from acetylene develop the synthesis of 4-nitrophenylacetylene.</p> <p>2. How cyclohexylemthyl-methy-dichlorosilane can be obtained from cyclohexanone?</p> <p>3. Starting from acetylene develop the preparation of 1,4-diphenylbutadiyne.</p>	
Work placement	Not applicable	

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