GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	MODERN METHODS OF SYNTHESIS, PG_00053226		
Field of study	Chemistry		
Date of commencement of studies	February 2024	Academic year of realisation of subject	2023/2024
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	prof. dr hab. inż. Dariusz Witt	

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_U02	Student is able to design conditions of experiment to accomplish task.	[SU1] Assessment of task fulfilment
K7_K01	Student understands modern chemical transformations.	[SK2] Assessment of progress of work
K7_K04	Student is familiar with analytical techniques required for identification and structure analysis of organic compound.	[SK2] Assessment of progress of work
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

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
multistep synthesis	60.0%	50.0%
test	60.0%	50.0%

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