GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	MODERN METHODS OF ORGANIC SYNTHESIS, PG_00066061		
Field of study	Nowoczesne metody syntezy organicznej		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2025/2026
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	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Organic Chemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Dariusz Witt	
	Teachers		

Lesson types

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	5.0	25.0	75

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] prepares detailed documentation of the results of independently conducted experiments and analyzes the obtained results, uses professional vocabulary with understanding and prepares and communicates information	Student is able to design conditions of experiment to accomplish task.	[SU1] Ocena realizacji zadania
[K7_K02] is able to cooperate and work in a group, taking on different roles	Student is ready and open for group discussion for development of synthetic strategy required for preparation of organic compounds	[SK5] Ocena umiejętności rozwiązywania problemów występujących w praktyce
[K7_U03] plans and performs the synthesis of chemical compounds with the required properties	The development of synthesis for organic compounds with required structure and properties is accomplished by student	[SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu
[K7_W04] indicates methods for the synthesis of chemical compounds with defined properties	Student is able to design synthesis of compounds with predicted properties	[SW2] Ocena wiedzy zawartej w prezentacji

Subject contents

Course content – lecture
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	
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.	
Practical activites within the subject	Not applicable	

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