GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Reaction Mechanisms in Organic Chemistry, PG_00049089						
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	Optional subject group			
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	2.0			
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	dr hab. inż. Sebastian Demkowicz					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	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	15	10.0	25.0	50

Subject objectives	A main goal is to teach students basics of the molecular orbital theory and frontier orbitals and their dignificance in understanding of chemical reactions.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_U01	Student is able to gain information from literature, databases and some other sources; then is able to integrate the gained information, make their interpretation, critical evaluation and draw conclusions as well as to formulate and substantiate his/her opinions	[SU3] Assessment of ability to use knowledge gained from the subject
K7_W02	The student has ordered and expanded knowledge related to modern organic chemistry, especially the mechanisms of chemical reaction	[SW1] Assessment of factual knowledge
K7_K01	Student understands the need of lifelong learning, can inspire and organize the learning process of other people.	[SK1] Assessment of group work skills

<table>
<tr><td>Subject contents</td><td>1. Construction of molecular orbitals from atomic orbitals.

2. Frontier orbitals theory.

3. Perturbation method and assesment of intermolecular interactions energy.

4. Theory of ghard and soft acids and bases (HSAB) in organic chemistry.

5. Pericyclic reactions:

a. cycloaddition reactions

b. electrocyclic reactions

c. sigmatropic rearrangements

6. The Woodward-Hoffman rules.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>A basic knowledge in organic chemistry with particular attention to simple reaction mechanisms.</td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>colloquium</td><td>60.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>1.R.W.Adler, R. baker, J. M. Brown "Mechanizmy reakcji w chemii organicznej" PWN Warszawa 1977

2. B. Miller "Advanced Organic Chemistry" Pearson Education International USA 2004</td></tr><tr><td>Supplementary literature</td><td>1. I. Fleming "Frontier orbitals and organic chemical reactions" J. Wilej & Sons 2007</td></tr><tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>The acid-catalyzed aldol condensation of acetone also produces some 2,6-dimethyl-2,5-heptadie-4-one. give a mechanism that explains the formation of this product.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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