



Subject card

Subject name and code	Reaction Mechanisms in Organic Chemistry, PG_00049089						
Field of study	Chemistry						
Date of commencement of studies	February 2022	Academic year of realisation of subject			2021/2022		
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 significance in understanding of chemical reactions.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	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		
	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_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		

Subject contents	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.											
Prerequisites and co-requisites	A basic knowledge in organic chemistry with particular attention to simple reaction mechanisms.											
Assessment methods and criteria	<table border="1" data-bbox="448 860 1487 931"> <thead> <tr> <th data-bbox="448 860 794 898">Subject passing criteria</th> <th data-bbox="794 860 1141 898">Passing threshold</th> <th data-bbox="1141 860 1487 898">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 898 794 931">colloquium</td> <td data-bbox="794 898 1141 931">60.0%</td> <td data-bbox="1141 898 1487 931">100.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	colloquium	60.0%	100.0%			
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Recommended reading	<table border="1" data-bbox="448 938 1487 1234"> <tbody> <tr> <td data-bbox="448 938 794 1144">Basic literature</td> <td colspan="2" data-bbox="794 938 1487 1144"> 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 data-bbox="448 1151 794 1200">Supplementary literature</td> <td colspan="2" data-bbox="794 1151 1487 1200">1. I. Fleming "Frontier orbitals and organic chemical reactions" J. Wiley & Sons 2007</td> </tr> <tr> <td data-bbox="448 1207 794 1234">eResources addresses</td> <td colspan="2" data-bbox="794 1207 1487 1234"></td> </tr> </tbody> </table>			Basic literature	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		Supplementary literature	1. I. Fleming "Frontier orbitals and organic chemical reactions" J. Wiley & Sons 2007		eResources addresses		
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Example issues/ example questions/ tasks being completed	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.											
Work placement	Not applicable											