GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Organic Chemistry, PG_00054705		
Field of study	Biotechnology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	first-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	2	Language of instruction	Polish
Semester of study	4	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Organic Chemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Sławomir Makowiec	
	Teachers	dr hab. Sławomir Makowiec	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	30.0	0.0	0.0	0.0	60

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	60	10.0	55.0	125

Subject objectives

A main goal is to teach students basic problems of organic chemistry including: the structure, properties reactions and reactions mechanisms of organic compunds

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_U02	Student is able to apply knowledge of general, physical and quantum chemistry necessary to predict the properties of biomolecules and the course of bioprocesses	[SU1] Assessment of task fulfilment
K6_W03	The student has a basic knowledge of the properties of organic and natural compounds and knows and understands the most important reaction mechanisms used to obtain organic compounds	[SW1] Assessment of factual knowledge

Subject contents

Course content – lecture

Organometallic Compounds
Nucleophilic Substitution in an Aromatic System
Phenol
Aldehyde and Ketone.
Keto-Enol Tautomerism
Acidity of Alpha Protons.
Aldol Condensation Reactions.
Cannizaro Reaction
Addition to Connected Double Carbons with Carbonyl and Related Fragments.
Carboxylic Acids and Acyl Derivatives, Nitriles, Halogenated Acids.
Claisen Condensation Reaction
Use of Malonate and Acetooctane in Synthesis.
Carbon Composition Derivatives.
Amines, Diazonium Salts.
Heterocyclic Compounds.
Carbohydrates and Amino Acids in Synthesis.

Course content – exercises

Organometallic Compounds
Nucleophilic Substitution in an Aromatic System
Phenol
Aldehyde and Ketone.
Keto-Enol Tautomerism
Acidity of Alpha Protons.
Aldol Condensation Reactions.
Cannizaro Reaction
Addition to Connected Double Carbons with Carbonyl and Related Fragments.
Carboxylic Acids and Acyl Derivatives, Nitriles, Halogenated Acids.
Claisen Condensation Reaction
Use of Malonate and Acetooctane in Synthesis.
Carbon Composition Derivatives.
Amines, Diazonium Salts.
Heterocyclic Compounds.
Carbohydrates and Amino Acids in Synthesis.

Prerequisites and co-requisites

Structure of elements and their compounds, especially carbon; acids, bases and salts; reaction types, geometry of molecules.

Completed the first part of the subject Organic Chemistry.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Tests on the exercise material	60.0%	20.0%
Exam	60.0%	50.0%
Mid-semester tests on lecture material	60.0%	30.0%

Recommended reading

Basic literature	1. J. D. Caserio, M. C. Roberts CHEMIA ORGANICZNA, PWN Warszawa, 1969 2. R. T. Morrison, R. N. Boyd CHEMIA ORGANICZNA, PWN Warszawa, 1997 3. J. McMurry CHEMIA ORGANICZNA, PWN Warszawa, 2017
Supplementary literature	1. J. March CHEMIA ORGANICZNA - Reakcje, mechanizmy, budowa, WNT Warszawa 1975 2. H. O. House NOWOCZESNE REAKCJE SYNTEZY ORGANICZNEJ, PWN Warszawa 1979 3. T. W. G. Solomons ORGANIC CHEMISTRY - 6th ed, John Wiley & Sons, Inc. New York, 1996
eResources addresses	

Example issues/ example questions/ tasks being completed	What process would you expect if potassium hydroxide were added to a mixture of acetone and benzaldehyde? Are organomagnesium compounds useful in the synthesis of the painkiller "Tramadol"? In what processes can you use phosgene? Why are aromatic amines weaker bases than ammonia?
Practical activites within the subject	Not applicable

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