GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Organic chemistry, PG_00035967		
Field of study	Chemical Technology		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2023/2024
Education level	first-cycle studies	Subject group	
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	6	ECTS credits	5.0
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. Maria Milewska	
	Teachers	prof. dr hab. inż. Maria Milewska dr hab. inż. Grzegorz Cholewiński dr inż. Jan Alfuth	

Lesson types and methods of instruction	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	5.0	60.0	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_U03	The student gained the knowledge in the field of basic syntheses of organic and macromolecular compounds, has the knowledge on organic compounds of natural origin and the use of chiral syntheses in industry.	[SU3] Assessment of ability to use knowledge gained from the subject
K6_W02	The student knows the intermolecular interactions and supramolecular technologies leading to the creation of novel structures.	[SW1] Assessment of factual knowledge

Subject contents	**Aromatic hydrocarbons** Alkadiens. Aromaticity, benzenoic and nonbenzenoic aromatic systems. Hydrogenation of benzene ring. Electrophilic substitution. Side chain reactions in substituted aromatic compounds. Aromatic hydrocarbons of condensed rings. Oil cracking, reforming, octan number **Aldehydes and ketones** Nomenclature, preparation and chemical properties, nucleophilic addition to the carbonyl group, oxidation and reduction, the Cannizzaro reaction, enols and enolates, the aldol condensation, halogenation, the haloform reaction. **Caboxylic acids and their derivatives** Nomenclature, acidity, preparation, reactions, carboxylic acid derivatives: esters and amides;.nucleophilic acyl substitution, decarboxylation, dicarboxylic acids, halogeno and hydroxy acids; keto-acids - -ketoacid decarboxylation reaction; carbonic acid derivatives, **Synthesis and reactions of -dicarbonyl compounds** the Claisen condensation, acetoacetic and malonic ester syntheses; barbiturates. **Nitrogen organic compounds** Amines nomenclature, basicity, preparation, reactions, diazonium salts, the Sandmayer reaction; nitriles. Nitro compounds preparation and reactions. **Phenols and aryl halides** Phenols preparation, acidic properties, electrophilic substitution, oxidation, Aryl halides SNAr reactions **Heterocyclic compounds** structure, aromaticity, preparation and reactions **Sulphur compounds** electronic structure, preparation **Natural compounds** carbohydrates, amino acids. peptides, proteins structure, preparation and typical reactions
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
Written and oral exam	50.0%	15.0%
Midterm tests on the lecture material	50.0%	25.0%
Midterm colloquium and tests from the exercise material	50.0%	60.0%

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 4. T. W. G. Solomons ORGANIC CHEMISTRY - 6th ed, John Wiley & Sons, Inc. New York, 1996
	Supplementary literature	1. J. Gawroński, K. Gawrońska, K. Kacprzak, M. Kwit WSPÓŁCZESNA SYNTEZA ORGANICZNA, PWN Warszawa 2004 2. J. March CHEMIA ORGANICZNA - Reakcje, mechanizmy, budowa, WNT Warszawa 1975 3. H. O. House NOWOCZESNE REAKCJE SYNTEZY ORGANICZNEJ, PWN Warszawa 1979 4. T. W. G. Solomons ORGANIC CHEMISTRY - 6th ed, John Wiley & Sons, Inc. New York, 1996
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. Give the product and mechanism of the reaction ive the product of the reaction of benzene and AlCl3 with a) an acyl chloride CH3CH2COCl; b) an acid anhydride (CH3CH2CO)2O. What is the electophile? Show contributing resonance structures. How can we used the acylation to the synthesize unrearranged alkyl side chains on an aromatic ring? Ilustrate by preparing n-propylbenzene.	
Work placement	Not applicable	