


KAPITAŁ LUDZKI
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez
 Unię Europejską w ramach
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Course title		ECTS code	
Organic chemistry		7.2.0475	
Name of unit administrating study			
Faculty of Chemistry			
Studies			
faculty	field of study	type	pierwszego stopnia
Wydział Chemii	Ochrona środowiska	form	stacjonarne
		specjalty	wszystkie
		specialization	wszystkie
Teaching staff			
dr hab. Beata Liberek, profesor uczelni; dr hab. Andrzej Nowacki; dr inż. Emilia Iłowska; dr Barbara Dmochowska; dr Justyna Samaszko-Fiertek			
Forms of classes, the realization and number of hours		ECTS credits	
Forms of classes		6	
Auditorium classes, Laboratory classes, Lecture		classes - 75 h	
The realization of activities		Tutorial classes 15 h	
classroom instruction		Student's own work - 60 h	
Number of hours		TOTAL: 150 h - 6 ECTS	
Lecture: 30 hours, Laboratory classes: 30 hours, Auditorium classes: 15 hours			
The academic cycle			
2023/2024 winter semester			
Type of course		Language of instruction	
obligatory		polish	
Teaching methods		Form and method of assessment and basic criteria for evaluation or examination requirements	
<ul style="list-style-type: none"> - conducting experiments - multimedia-based lecture - problem solving 		Final evaluation	
		<ul style="list-style-type: none"> - Graded credit - Examination 	
		Assessment methods	
		<ul style="list-style-type: none"> - written exam with open questions - (mid-term / end-term) test - graded course credit based on individual grades obtained during the semester 	
		The basic criteria for evaluation	

The basic criteria for evaluation

Lecture:

Achievement of at least 51% of the total number of points from the exam. The exam consists of about ten open questions concerning material discussed in the lectures. The percentage result is correlated with the mark in the way indicated in "Study Regulations of University of Gdansk".

Auditorium exercises:

Achievement of at least 51% of the total number of points from each colloquium, which consist of material discussed during exercises. The percentage result is correlated with the mark in the way indicated in "Study Regulations of University of Gdansk".

Laboratory exercises:

Student is required to:

- Perform TLC analysis
- Synthesize two organic compounds, one liquid and one solid
- Achieve at least 51% of the total number of points from three colloquia (preliminary, compound 1 and compound 2), respectively. The final result is an average of the obtained partial results. Percentage result is correlated with the mark in the way indicated in "Study Regulations of University of Gdansk".

Method of verifying required learning outcomes

Required courses and introductory requirements

A. Formal requirements

Required courses and introductory requirements

Formal requirements

General chemistry

B. Prerequisites

Prerequisites

Basics of general chemistry

Aims of education

Aims of education

Acquiring knowledge of typical groups of organic compounds, their structure, nomenclature, physical properties and characteristic reactions; learning of types of organic reactions and selected mechanisms; acquainting students with the issues of isomerism, particularly stereoisomerism; As a part of laboratory exercises students familiarize themselves with the experimental work by performing of the TLC analysis and synthesis of two organic compound, one liquid and one solid. Exercises are aimed at developing the skills of conducting experiments and solving experimental problems independently.

Course contents

A. Lecture issues:

Atomic orbitals; Hybridization; Chemical bonds; Dipole moment; Inductive effect; Formal charge; Lewis structures; Mesomeric effect; Intermolecular forces; Acidity and basicity; Nucleophile and electrophile; Types of organic reactions; Thermodynamic and kinetic of organic reactions; Alkanes: structure, nomenclature, boiling points and solubility, isomerism, occurrence, conformations, synthesis; Alkanes acidity, carboanions, organometallic compounds, protic and aprotic solvents; Alkanes burning; Alkanes halogenation: mechanism, reactivity, carbon radicals; Cycloalkanes: nomenclature, cis-trans isomerism, stability, cyclohexane conformations; Alkenes: nomenclature, structure, stereoisomerism, stability, physical properties, synthesis; Hydrogenation of alkenes; Electrophilic additions: Markovnikov's rule, carbocation; Radical addition of HBr; Alkenes polymerization; Alkynes: nomenclature, structure, physical properties, synthesis; acidity; addition reactions; Aromatic compounds: benzene, conditions of aromaticity, other aromatic compounds; Electrophilic substitution, substituent's effect; Optical isomerism: chiral atom, configuration determination, Fischer projection, relative configuration, other types of chirality, biological significance; Halogenoalkanes: characteristic, nomenclature, physical properties, synthesis; Mechanism of nucleophilic substitution and eliminations; Alcohols: structure, nomenclature, physical properties, synthesis, acidity, typical reactions; Phenols: nomenclature, acidity, typical reactions; Ethers: nomenclature, physical properties, synthesis, cyclic ethers; Aldehydes and ketones: nomenclature, physical properties, synthesis; Nucleophilic addition: mechanism and reactions; Aldehyde oxidation; Alpha hydrogen acidity: tautomerization, aldol condensation; Carboxylic acids: structure, nomenclature, physical properties, synthesis, acidity; Carboxylic acid salts; Derivatives of carboxylic acids; structures, nomenclature, synthesis, acyl nucleophilic substitution; Esterification; Triglycerides; Amines: structures, nomenclature, physical properties, synthesis, basicity, typical reactions; Ammonium salts; Introduction to multifunctional compounds: amino acids and carbohydrates.

B. Problems of auditorium exercises: Solving problems regarding: determining the relationship between structure and properties, including reactivity, of the compounds belonging to the subsequent groups of organic compounds, discussed during the lectures; isomerism of organic compounds with particular emphasis on stereoisomerism; basic mechanism of the organic reactions.

C. Problems of laboratory exercises: Work safety in chemical laboratory; Basics of laboratory work; Conducting of TLC analysis; Synthesis of two organic compound: one solid and one liquid.

Bibliography of literature

Bibliography of literature

Literature required to pass the course

J. McMurry Chemia organiczna,

R. T. Morrison, R. N. Boyd Chemia organiczna

P. Mastalerz Chemia organiczna

G. Kupryszewski Wstęp do chemii organicznej

J. Wade Organic Chemistry

P. Y. Bruice Organic Chemistry

G. Kupryszewski, M. Sobocińska, R. Walczyna Podstawy preparatyki organicznych związków chemicznych

A. Vogel Preparatyka organiczna

J. Wróbel Preparatyka i elementy syntezy organicznej

Extracurricular readings

The learning outcomes (for the field of study and specialization)**Knowledge****Skills****Social competence****Contact**

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