FACULTY OF CHEMISTRY

SUBJECT CARD

Name of subject in Polish	Chemia organiczna
Name of subject in English	Organic chemistry
Main field of study (if applicable):	Biotechnology
Specialization (if applicable):	
Profile:	academic
Level and form of studies:	1st level, full-time
Kind of subject:	obligatory
Subject code	
Group of courses	NO

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)			30		
Number of hours of total student workload (CNPS)			60		
Form of crediting			Crediting with grade		
For group of courses mark (X) final course					
Number of ECTS points			2		
including number of ECTS points for practical (P) classes			2		
including number of ECTS points for direct teacher-student contact (BU) classes			1,4		

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Completion of the course Principles of Organic Chemistry - laboratory.

SUBJECT OBJECTIVES

C1 Getting accustomed with advanced experimental techniques of organic synthesis.
C2. Strengthening skills related to preparative organic chemistry, planning of the synthesis and product characterization.

SUBJECT LEARNING OUTCOMES

relating to skills:
PEK_U01 The student is able to plan and perform complex laboratory experiments.
PEK_U02 The is able to predict reaction products depending on the mechanisms of processes and reaction conditions.
PEK_U03 The student is able to determine physicochemical constants, characterize the products and carry out the documentation of the experiment.
PEK_U04 The student knows the risk of working with organic compounds and the ways to circumvent.

PROGRAM CONTENT

	Laboratory	**Number of hours**
Lab 1	Rules of course completion. Documentation of the experiments. Presentation of laboratory glassware and apparatus sets. Training on security.	4
Lab 2	Azo dye, naphthol orange. Reaction of amines with nitrous acid, coupling of diazonium salts. Crystallization, solvent selection, drying of solids.	4

Lab 3	Nitration of phenol. Electrophilic substitution of aromatic compounds. Directing effect of the substituents. Cooling the reaction mixtures, cooling baths.	4
Lab 4	Separation of nitrophenol isomers. Steam distillation. Thin layer chromatography - reaction control and identification of isomers.	4
Lab 5	Synthesis of cyclohexanone ketal. Reactions of carbonyl compounds with nucleophiles. Azeotrope, azeotropic distillation.	4
Lab 6	Distillation of cyclohexanone ketal under reduced pressure. Work under reduced pressure, requirements of the equipment.	4
Lab 7	Synthesis of luminol. Chemiluminescence. Reactions of carbonyl compounds with nucleophiles. Methods for nitro group reduction.	4
Lab 8	Verification of experiments documentation and course completion.	2
	Total hours	30

TEACHING TOOLS USED

N1. carrying out of experiments
N2. documentation in lab notebook

EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT

Evaluation (F – forming (during semester), P – concluding (at semester end)	Learning outcomes number	Way of evaluating learning outcomes achievement
F1	PEK_U01–PEK_U04	average mark of three short tests
F2	PEK_U01–PEK_U04	assessment of preparation and carrying out the experiments, and documentation in the lab notebook

C = (F1 + F2)/2 (both components must be passed, > 3.0)

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] A. I. Vogel, Preparatyka organiczna, PWN, WNT, 2018.
[2] J. McMurry, Chemia organiczna, tom 1-5, PWN, Warszawa, 2017.

SECONDARY LITERATURE:

[1] Red. P. Kowalski, Laboratorium chemii organicznej, PWN, WNT, Warszawa, 2018.

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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