

FACULTY OF CHEMISTRY					
<b>SUBJECT CARD</b>					
Name of subject in Polish	Wieloetapowa Synteza Organiczna				
Name of subject in English	Multistep Organic Synthesis				
Main field of study (if applicable):	Chemia				
Specialization (if applicable):	Medicinal Chemistry				
Profile: -	academic				
Level and form of studies:	2nd level, full-time				
Kind of subject:	obligatory				
Subject code	CHC024063				
Group of courses	NO				
	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)			60		
Number of hours of total student workload (CNPS)			90		
Form of crediting			Crediting with grade		
For group of courses mark (X) final course					
Number of ECTS points			3		
including number of ECTS points for practical (P) classes			3		
including number of ECTS points for direct teacher-student contact (BK) classes			2		
<b>PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES</b>					
1. Knowledge and skills at the level of completion of "Fundamentals of Organic Chemistry - laboratory" course, or equivalent.					
2. Basic knowledge of English					
<b>\SUBJECT OBJECTIVES</b>					
C1 Gathering proficiency in the laboratory work using advanced experimental techniques of organic synthesis.					
C2 Abilities to employ various transformation methods in a multi-step synthesis.					
C3 Planning and execution of a complex synthetic sequence based on the literature data					
<b>SUBJECT EDUCATIONAL EFFECTS</b>					
<b>relating to skills:</b>					
PEK_U01 - is able to perform multistep synthesis of an organic compound, select and assemble the appropriate equipment, identify and characterize the products obtained,					
PEK_U02 - can use professional scientific literature and databases to plan the strategy and tactics of the synthesis,					
PEK_U03 - can choose reaction conditions of various transformations, plan the methods of products isolation and purification,					
PEK_U04 - is able to interpret the results, to evaluate the purity of the product by defining basic physicochemical properties, to interpret spectra of organic compounds and to write laboratory notebook in English.					
<b>PROGRAMME CONTENT</b>					
<b>Laboratory</b>					<b>Number of hours</b>
Lab 1	Conducting the laboratory and completion rules. Laboratory notebook. Basic equipment (glass and metal), and laboratory operations. Safety issues: hazardous substances, flammable, etc. Planning the synthesis - the use of the literature and				4

	databases.	
Lab 2	Carrying out two or three-step synthesis of two obligatory compounds (2,4-dinitrophenylhydrazine, nicotinic acid, (R)-(-)-carvone or other of choice)	4
Lab 3		4
Lab 4		4
Lab 5		4
Lab 6		Planning and carrying out the synthesis of two organic compounds (2-4 step sequential processes) using different types of organic reactions: alkylation, acylation, elimination, nucleophilic substitution, electrophilic substitution, oxidation and reduction, cycloaddition. Conversion of alcohols, carbonyl compounds, carboxylic acids and their derivatives, amines, expansion of the carbon scaffold.
Lab 7	4	
Lab 8	4	
Lab 9	4	
Lab 10	4	
Lab 11	4	
Lab 12	4	
Lab 13	4	
Lab 14	Purification, identification and characterization of the products. Interpretation of the results, writing the reports.	4
Lab 15	Revision of the laboratory equipment and reports.	4
	Total hours	60
<b>TEACHING TOOLS USED</b>		
N1. planning and execution the experiments N2. writing reports (in English)		
<b>EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT</b>		
<b>Evaluation</b> (F – forming (during semester), P – concluding (at semester end))	Educational effect number	Way of evaluating educational effect achievement
C	PEK_U01 –PEK_U04	Planning and preparation of two organic compounds (2-4 synthetic steps), characterization of the products, writing the reports.
<b>PRIMARY AND SECONDARY LITERATURE</b>		
<b>PRIMARY LITERATURE:</b>		
[1] A. Mucha, R. Siedlecka, Multistep organic synthesis. practical course, Wrocław, 2010;		
[2] A. I. Vogel, Preparatyka organiczna, WNT, Warszawa, 2006;		
Databases: Beilstein, Chemical Abstracts, Current Contents		
<b>SECONDARY LITERATURE:</b>		
[1] J. Gawroński, K. Gawrońska, K. Kacprzak, M. Kwit, Współczesna synteza organiczna, PWN, Warszawa, 2004		
<b>SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)</b>		
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