

<b>Course title</b> Wykład monograficzny - Chemiczna synteza peptydów/Monographic lecture - Chemical synthesis of peptides		<b>ECTS code</b> 13.3.1107	
<b>Name of unit administrating study</b> Faculty of Chemistry			
<b>Studies</b>			
<b>Field of study</b>	<b>Type</b>	<b>Form</b>	
Chemical business	Master	Full-time studies	
<b>Teaching staff</b> <b>Prof. dr hab. Piotr Rekowski</b>			
<b>Forms of classes, the realization and number of hours</b>		<b>ECTS credits</b>	
<b>A. Forms of classes, in accordance with the UG Rector's regulations</b> Lecture		lecture 30 hours consultation 10 hours student's own work 35 hours  <b>TOTAL: 75 hours - 3 ECTS credits</b>	
<b>B. The realization of activities</b> lecture in the didactic room			
<b>Number of hours</b> 30 hours			
<b>The academic cycle</b> 2021/2022 winter semester			
<b>Type of course</b> obligatory		<b>Language of instruction</b> Polish	
<b>Teaching methods</b> Lecture with multimedia presentation		<b>Form and method of assessment and basic criteria for evaluation or examination requirements</b>	
		<b>A. Final evaluation, in accordance with the UG study regulations</b> Course completion (with a grade)	
		<b>B. Assessment methods</b> - <b>Written exam with open questions</b>	
		<b>C. The basic criteria for evaluation or exam requirements</b>  Positive grade received in written exam composed of 3-5 open questions covering issues listed in the course contents; answers to these questions will require solving tasks specified in educational outcomes; the grading scale would be adjusted to the range of all rated exams. classes	
<b>Required courses and introductory requirements</b> <b>Formal requirements</b> The student should have completed a graduate study lecture: "Physicochemical properties of amino acids and their derivatives"			
<b>Aims of education</b> <ul style="list-style-type: none"> <li>• introduction students with all issues listed in the lecture program content,</li> <li>• discussion of the nomenclature used in amino acid and peptide chemistry</li> <li>• describe the structure of a peptide bond,</li> <li>• familiarizing students with the basic methods of peptide bond synthesis</li> <li>• teaching students how to design peptide synthesis</li> </ul>			

### Course contents

**Lecture topics:** Nomenclature used in amino acid and peptide chemistry. Peptide bond - introduction and characterization. Protective groups of amine and carboxyl, alcohol, guanidine, thiol, imidazole, indole, amide functions, introducing and removal protecting groups from these groups, orthogonality of protecting groups. Advantages and disadvantages of these protective groups. Peptide bond synthesis methods: azide, anhydride, active esters, carbodiimide, with phosphorus, uronium, enzymatic compounds. Tactics and strategy of chemical peptide synthesis. Tactics of Boc / Bzl and Fmoc / But (Trt) synthesis. Side reactions and adverse processes during peptide synthesis - prevention methods. Peptide synthesis on a solid support (Merrifield synthesis). Racemization during peptide synthesis, methods for preventing racemization.. Automation of the peptide synthesis process. Trends and news in peptide synthesis. New condensing agents, carrier resins and functional group covers. Synthesis of phosphopeptides and glycopeptides, unnatural amino acids in peptide synthesis, chemical modifications leading to more rigid peptide conformations.

### Bibliography of literature

#### A. Literature required to pass the course

1. Sewald N., Jakubke H., "Peptides: chemistry and biology", (A.J. Kerstin, ed.) Elsevier 2006, M. Wiley-VCH Verlag
2. Jones J. Amino Acid and Peptide Synthesis, Oxford University Press, 2002
3. Some topics will be discussed on monographic publications

#### B. Extracurricular readings

other monographic works presenting issues contained in the lecture content of the subject

### Knowledge

1. defines the basic issues of peptide chemistry
2. names amino acid derivatives, peptides and their derivatives
3. explains the mechanisms of racemization in peptide synthesis
4. characterizes methods of peptide bond formation
5. lists protective groups used in peptide synthesis
6. presents principles of solid-peptide synthesis

### Social competence

1. understands the need for continuous education,
2. appreciates the usefulness of discussions and consultations
3. is aware of the need for critical analysis of own work
4. shows creativity in searching for alternative solutions