Course title Wykład monograficzny - Chemiczna synteza peptydów/Monographic lecture - Chemical synthesis of peptides	ECTS code 13.3.0503

Name of unit administrating study
Faculty of Chemistry

Studies			
Field of study	**Type**	**Form**	
Chemistry	Master	Full-time studies	

Teaching staff
Prof. dr hab. Piotr Rekowski

Forms of classes, the realization and number of hours	ECTS credits

A. **Forms of classes, in accordance with the UG Rector's regulations**
     Lecture
 	
B. **The realization of activities**
  lecture in the didactic room
 	
  Number of hours
  30 hours
	lecture 30 hours
	consultation 10 hours
	student's own work 35 hours
	
	TOTAL: 75 hours - 3 ECTS credits

The academic cycle
2020/2021 winter semester

Type of course obligatory	Language of instruction Polish

Teaching methods Lecture with multimedia presentation	Form and method of assessment and basic criteria for evaluation or examination requirements
	A. Final evaluation, in accordance with the UG study regulations Course completion (with a grade)
	B. Assessment methods - **Written exam with open questions**
	C. The basic criteria for evaluation or exam requirements 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

Required courses and introductory requirements
  Formal requirements The student should have completed a graduate study lecture: "Physicochemical properties of amino acids and their derivatives"

  Aims of education
  • introduction students with all issues listed in the lecture program content,
  • discussion of the nomenclature used in amino acid and peptide chemistry
  • describe the structure of a peptide bond,
  • familiarizing students with the basic methods of peptide bond synthesis
  • teaching students how to design peptide synthesis

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