

Course title Wykład specjalizacyjny - Właściwości fizykochemiczne aminokwasów i ich pochodnych / Graduate study lecture - Physicochemical properties of aminoacids and their derivatives		ECTS code 13.3.0413	
Name of unit administrating study Faculty of Chemistry			
Studies			
Field of study	Type	Form	
Chemistry	Master	Full-time studies	
Teaching staff Jarosław Ruczyński, PhD, DSc			
Forms of classes, the realization and number of hours		ECTS credits 3 classes 30 h tutorial classes 10 h student's own work 35 h TOTAL: 75 h - 3 ECTS	
A. Forms of classes, in accordance with the UG Rector's regulations Lecture			
B. The realization of activities In-class learning			
Number of hours 30			
The academic cycle 2019/2020 summer 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 6-10 open questions	
		C. The basic criteria for evaluation or exam requirements <ul style="list-style-type: none"> positive evaluation of the written exam consisting of 6-10 open questions covering issues mentioned in the subject curriculum contents; answers to the questions will require solving tasks related to the assumed effects of education; the grading scale will be adjusted to the rating range of the assessed written work negative grade should be improved 	
Required courses and introductory requirements <ol style="list-style-type: none"> Formal requirements completed courses in organic chemistry and biochemistry Prerequisites basic knowledge of organic chemistry and biochemistry 			
Aims of education The aim of the course is to familiarize students with: <ul style="list-style-type: none"> the issues set out in the program content of the lecture the chemical structure and occurrence and significance of amino acids in the Nature the essential physicochemical properties of amino acids, methods of their synthesis and analytical techniques used in identification and qualitative and quantitative analysis of amino acids On completion of the course the student shall be able to evaluate critically of the information about the importance of amino acids in the Nature and the effect of amino acids on human health			
Course contents <ul style="list-style-type: none"> Chemical structure, nomenclature and classification of amino acids. The occurrence and significance of amino acids found in the Nature. Stereochemistry of amino acids (relative and absolute configuration, optical activity). Physiological properties of amino acids (toxicity and metabolism). Physicochemical properties of amino acids (smell, taste, physical state, solubility, melting point, acidic/basic properties, optical and spectroscopic properties). Typical and specific chemical reactions of amino acids. The method for obtaining of 			

amino acids (prebiotic synthesis, biosynthesis, extracting of amino acids from the protein hydrolysates, microbiological, enzymatic and synthetic methods – typical, specific and chiral).

- Methods of separation of racemic mixtures of amino acid into enantiomers. The methods of separation (chromatographic and electrophoretic) and analysis (mass spectrometry, sequencing) of amino acids. The use of amino acids in industry (food, pharmaceutical, cosmetic and chemical industries). Unnatural (synthetic) amino acids – properties, preparation and application.

Bibliography of literature

A. Literature required to pass the course

- Jakubke HD, Jeschkeit H – „Aminokwasy, peptydy, białka”
- Kołodziejczyk A – „Naturalne związki organiczne”
- C. Barret – „Chemistry and biochemistry of amino acids”
- Ahluwalia VK, Kumar LS, Kumar S – „Chemistry of natural products: amino acids, peptides, proteins and enzymes”
- monographic papers provided by the lecturer

B. Extracurricular readings

- various handbooks concerning chemistry and biology of amino acids

Knowledge

- defines and presents the chemical structure of amino acids and their derivatives
- knows how to name amino acids and their derivatives, explains their importance for the functioning of living organisms
- characterizes the basic physical and physiological properties of amino acids
- describes and illustrates by means of chemical reactions the basic chemical properties of amino acids and methods for their preparation
- characterizes the basic techniques used in the identification and quantitative analysis of amino acids
- knows the application of amino acids in the food, pharmaceutical, cosmetic and chemical industries

Skills

Has the ability to critically evaluate the results of conducted experiments, observations and/or theoretical calculations.

Social competence

- understands the need for continuous education,
- is aware of the need for a critical analysis of his own work
- shows cautious criticism in receiving information (particularly available in the mass media) regarding the impact of amino acids and their derivatives on the functioning of living organisms and their application in the pharmaceutical, food and cosmetics industries