


KAPITAŁ LUDZKI
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez
 Unię Europejską w ramach
 Europejskiego Funduszu
 Społecznego

UNIA EUROPEJSKA
 EUROPEJSKI
 FUNDUSZ SPOŁECZNY


Nazwa przedmiotu		Kod ECTS	
Application of spectroscopy in bioinorganic chemistry		13.3.1213	
Nazwa jednostki prowadzącej przedmiot			
Katedra Chemii Bionieorganicznej			
Studia			
wydział	kierunek	poziom	drugiego stopnia
Wydział Chemii	Biznes chemiczny	forma	stacjonarne
		moduł specjalnościowy	wszystkie
		specjalizacja	wszystkie
Wydział Chemii	Chemia	poziom	drugiego stopnia
		forma	stacjonarne
		moduł specjalnościowy	wszystkie
		specjalizacja	wszystkie
Wydział Chemii	Ochrona środowiska	poziom	drugiego stopnia
		forma	stacjonarne
		moduł specjalnościowy	wszystkie
		specjalizacja	wszystkie
Nazwisko osoby prowadzącej (osób prowadzących)			
prof. UG, dr hab. Agnieszka Chylewska			
Formy zajęć, sposób ich realizacji i przypisana im liczba godzin		Liczba punktów ECTS	
Formy zajęć		2	
Ćw. laboratoryjne		classes – 15 hours	
Sposób realizacji zajęć		tutorial classes – 10 hours	
zajęcia w sali dydaktycznej		student's own work – 25 hours	
Liczba godzin		Total: 50 h – 2 ECTS	
Ćw. laboratoryjne: 15 godz.			
Termin realizacji przedmiotu			
2023/2024 zimowy			
Status przedmiotu		Język wykładowy	
fakultatywny (do wyboru)		angielski	
Metody dydaktyczne		Forma i sposób zaliczenia oraz podstawowe kryteria oceny lub wymagania egzaminacyjne	
an individual work, experiments and measurements performing and an analysis of obtained results and discussion.		Sposób zaliczenia	
		Zaliczenie na ocenę	
		Formy zaliczenia	
		Students write 4 short tests (Pre-Lab Test) and 4 detailed reports (Post-Lab Report)	
		Podstawowe kryteria oceny	
		positive note from all short tests and reports, final note is an average from notes from all tests	
		91-100%: 5.0	
		81-90%: 4.5	
		71-80%: 4.0	
		61-70%: 3.5	
		51-60%: 3.0	
		< 51%: 2.0	
Sposób weryfikacji założonych efektów uczenia się			

Business Chemistry:

During the laboratory exercises, the student solves problems in writing (tests) or oral (oral answer) in the field of bioinorganic chemistry. The method of verifying the acquisition of skills: Assessment of the student's involvement in discussions on the issues related to this subject (K_BChII_W01). Assessment of independent conducting of chemical experiments by the student (K_BChII_U04). Assessment of the Student's explanation of the course of chemical experiments, assessment of the correctness of the analysis of the results, drawing conclusions from the experiments and preparation of reports. The student assesses the usefulness and functioning of the existing engineering and technical solutions as well as research and measurement methods in the chemical industry (K_BChII_K04).

Chemistry:

During the laboratory exercises, the student solves problems in writing (tests) or oral (oral answer) in the field of bioinorganic chemistry. (K_W01) the item. Assessment of the student's independent conduct of chemical experiments. Assessment of the Student's explanation of the course of chemical experiments, assessment of the correctness of the analysis of results, drawing conclusions from the conducted experiments and preparation of reports. (K_U05). Method of verifying the acquisition of social competences: Assessment of the Student's ability to solve scientific and research problems on the basis of work The student identifies the level of their knowledge and skills as well as the need for updating knowledge, continuous professional training and personal development. (K_K06).

Environmental Protection:

During the laboratory exercises, the student solves problems in writing (tests) or oral (oral answer) in the field of general and inorganic chemistry. (K_OŚII_W04) The method of verifying the acquisition of skills: Assessment of the student's involvement in discussions on the issues related to this subject. Assessment of the student's independent conduct of chemical experiments. Assessment of the Student's explanation of the course of chemical experiments, assessment of the correctness of the analysis of the results, drawing conclusions from the experiments and preparation of reports. The student correctly assesses the usefulness and functioning of the existing engineering and technical solutions as well as research and measurement methods in the chemical industry. (K_OŚII_U03) The method of verifying the acquisition of social competences: Assessment of the student's ability to solve scientific and research problems on the basis of individual and team work. (K_OŚII_K02)

Określenie przedmiotów wprowadzających wraz z wymogami wstępnymi**A. Wymagania formalne**

lack

B. Wymagania wstępne

lack

Cele kształcenia

to give the students an idea of the importance and significance of chemistry in our lives and body;
to develop specific interests, habits, and abilities encompassing all sciences;
to help the student discover whether he/she has an aptitude for further work in pure or applied sciences and to induce such people to continue science studies

Treści programowe

Topics of the lecture:
safety practices and basic laboratory (filtration, crystallization, distillation, extraction, chromatography) and instrumental techniques (UV, ATR, IR, NMR spectroscopy) in chemistry
chemical kinetics and equilibria (the effect of certain factors on the reaction rate, type of catalysts, the significance of the equilibrium constant, determining the effect of certain factors on the equilibrium)
solutions (types of solutions and solubility, factors affecting the solubility of compounds, calibration plots, expressing solution concentration, solubility equilibria and solubility product constant, stability of complexes, relative strengths of oxidizing and reducing agents, relative reactivities of coordination compounds)
acid-base equilibria (the nature of acids and bases, acid strength and the acid ionization constant, autoionization of water and pH, buffers and their effectiveness, titrations and pH curves; reduction and oxidation processes in acidic and basic solutions)

Wykaz literatury

I. Bertini, D. Garner, S.J. Lippard. J. Reedijk, A.X. Trautwein, M.J. Clarke, E. Kimura, K.N. Raymond, P.J. Sadler, R. Weiss, „Topics in Biologically Inorganic Chemistry” Volume 1, Springer, 1-200, 1999.
R. S. Mikkelsen, E. Corton, „Bioanalytical Chemistry” Wiley-Interscience, 1-375, 2004.
G. A. Lawrance, „Introduction to Coordination Chemistry”, University of Newcastle, Callaghan, NSW, Australia A John Wiley, 1-307, 2010.
G.E. Rodgers, „Descriptive Inorganic, Coordination, and Solid-State Chemistry, Third Edition” Belmont, Brooks Cole, USA, 1-668, 2012.

Kierunkowe efekty uczenia się

Chemical Biznes

K_BChII_W01

knows and understands in-depth complex physicochemical

Wiedza

Students will be able to:

integrate theory and practice to solve qualitative and quantitative problems relating to familiar and unfamiliar aspects of chemistry,
integrate information or data from a variety of sources,

<p>processes and is able to analyse their course in connection with other fields of science</p> <p>K_BChII_U04 is able to independently plan and perform specific research tasks in the field or in the laboratory, interpret their results working individually or in a team, assuming various roles and functions in it</p> <p>K_BChII_K04 is willing to properly assess the acquired knowledge, respect it and disseminate it in order to solve specific cognitive and practical issues</p> <p>Chemistry</p> <p>K_W01 uses in-depth knowledge of spectroscopic methods of chemical compound analysis</p> <p>K_U05 presents the results of research in the form of an independently written paper containing a description and justification of the purpose of the work, adopted methodology, results and their significance in comparison to other similar research</p> <p>K_K06 undertakes research tasks consciously and responsibly, understanding the social aspects of the practical application of the acquired knowledge and skills and the responsibility related to it</p> <p>Environmental Protection</p> <p>K_OŚII_W04 chooses methods, techniques and research tools used in environmental protection</p> <p>K_OŚII_U03 plans and performs research tasks in the field or laboratory and interprets research results on environmental issues (working individually or in a team assuming various roles, including managerial functions)</p> <p>K_OŚII_K02 recognises threats, creates safe work conditions and is responsible for the safety of own and other people's work</p>	<p>appreciate the need for good practice in data collection and processing</p> <p>Umiejętności</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> understand the objective of their chemical experiments, properly carry out the experiments, and appropriately record and analyze the results, be able to use standard laboratory equipment, modern instrumentation, and classical techniques to carry out experiments, know and follow proper procedures and regulations for safe handling and use of chemicals, communicate the concepts and results of their laboratory experiments through effective writing and oral communication skills. <p>Kompetencje społeczne (postawy)</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> work effectively in diverse teams both in the classroom and in the laboratory, employ critical thinking and efficient problem-solving skills, conduct experiments, analyse data, and interpret results, while observing the rules of responsible and ethical scientific conduct; develop effective written and oral communication skills, especially the ability to convey complex technical information in a clear and concise manner.
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