



Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego



Course title	ECTS code
Advanced chemistry laboratory - bioinorganic chemistry	13.3.0433
Name of unit administrating study	

Faculty of Chemistry

#### **Studies**

faculty	field of study	type	drugiego stopnia
Wydział Chemii	Chemia	form	stacjonarne
		specialty	analityka i diagnostyka chemiczna, chemia obliczeniowa
		specialization	wszystkie

#### **Teaching staff**

dr hab. Dariusz Wyrzykowski: dr Aleksandra Tesmar

ar hab. Banasz vyrzykowski, ar z nokoanara reemar		
Forms of classes, the realization and number of hours	ECTS credits	
Forms of classes	1	
Laboratory classes	classes - 20 h	
The realization of activities	tutorial classes – 2 h	
classroom instruction	student's own work – 3 h	
Number of hours		
Laboratory classes: 20 hours	Total: 25 h - 1 ECTS	

# The academic cycle

2022/2023 winter semester	
Type of course	Language of instruction
obligatory	polish
Teaching methods	Form and method of assessment and basic criteria for eveluation or examination requirements
conducting experiments	Final evaluation
	Graded credit
	Assessment methods
	- ssignment work – conducting research and presenting results
	- (mid-term / end-term) test
	- graded course credit based on individual grades obtained during the semester
	The basic criteria for evaluation
	Lab classes - execution of laboratory exercises, correct preparation of reports from
	conducted laboratory work, obtaining a positive assessment from a test that includes
	laboratory exercises

# Method of verifying required learning outcomes

The student solves problems in writing (tests) or orally (answer stopped) in the field of synthesis and physicochemistry of chemical compounds, as well as the use of analytical techniques (K W01, K W03, K W07, K W10). The tutor observes the Student's work, paying attention to the Student's compliance with the rules of occupational health and safety.

The tutor assesses the way the Student uses research equipment to solve the problems posed to him (K\_U01, K\_U02). The lecturer assesses the calculation method, the analysis of the measurement results and the conclusions from the experiments on the basis of the report prepared by the student (K U08).

Posing scientific and research problems to the student, and then analyzing his ability to solve them in a team (K\_K01). The student solves the problems posed by the lecturer regarding the use of the acquired chemical knowledge and skills to protect human health and life and the natural environment.

### Required courses and introductory requirements

### A. Formal requirements

Completed inorganic chemistry course

# Laboratorium zaawansowanej chemii - chemia bionieorganiczna #13.3.0433

Sylabusy - Centrum Informatyczne UG



# B. Prerequisites

none

#### Aims of education

- a continuation and extension of the course of inorganic, physical and coordination chemistry
- the aim of the course is to acquaint students with the fundamental procedures of the examination of compounds of biological interest
- this laboratory is intended to familiarize students with a designing of an experiment, an interpretation of the data and the methods of a visualization and a presentation of the results
- a presentation the most important contemporary issues related to the investigation of the biological properties of the compounds based on the chemical tests
- a development of the ability for planning and carrying out a single-handed experiments as well as for interpreting obtained data

#### **Course contents**

Laboratory techniques used for investigating of coordination compounds.

The stopped flow method for studying reaction kinetics.

Isothermal titration calorimetry for studying macromolecule - ligand interactions.

The use of various buffer solutions for the preparation of biological samples for chemical tests. Familiarizing with the support of computer programs used for analysis and presentation of the results obtained.

#### Bibliography of literature

Literature required to pass the course

- S. Gaisford, M. A. A. O'Neill, "Pharmaceutical Isothermal Calorimetry", Informa Healthcare USA, Inc., NY (2007)
- J. Keeler, "Kinetics of Chemical Reactions", University of Cambridge, Departament of Chemistry, 25, IA Chemistry 2002/03 Extracurricular readings

L. Stryer, J. L. Tymoczko, J. M. Berg, "Biochemistry", 5 Edition 2005

# The learning outcomes (for the field of study and specialization)

# Knowledge

Correct nomenclature in relation to the study of kinetics and thermodynamics of chemical compounds.

Knowledge of chemical processes and reactions in which complex compounds take part.

Knowledge of advanced techniques for testing complex compounds in solutions. Knowledge of the use of advanced techniques for testing complex compounds used in various industries.

# Skills

Support for advanced research instruments used to study complex compounds used in various industries.

Support for computer programs used to perform physicochemical calculations and data visualization.

Planning and conducting chemical experiments using advanced measurement techniques.

Solving practical problems using spectrophotometric and calorimetric methods. Predicting observations and formulating conclusions resulting from conducted chemical experiments. Justifying the opinions presented.

# Social competence

Using chemical knowledge in correlation with other natural sciences to explain the course of phenomena encountered in everyday life.

The ability to use the acquired knowledge to assess the threat and planning ways to counteract the threats to human health and the environment

Correct identification and resolution of dilemmas related to the performance of chemical experiments involving inorganic and coordination compounds.

Understanding the social aspects of the practical application of the acquired knowledge and skills and the related responsibility.

# Contact

dariusz.wyrzykowski@ug.edu.pl