


**KAPITAŁ LUDZKI**  
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez  
 Unię Europejską w ramach  
 Europejskiego Funduszu  
 Społecznego

**UNIA EUROPEJSKA**  
 EUROPEJSKI  
 FUNDUSZ SPOŁECZNY


|   |                       |   |  |
|---|-----------------------|---|--|
| <b>Course title</b>   |                       | <b>ECTS code</b>  |  |
| Inorganic chemistry   |                       | 13.3.0965   |  |
| <b>Name of unit administrating study</b>  |                       |   |  |
| Faculty of Chemistry  |                       |   |  |
| <b>Studies</b>  |                       |   |  |
| <b>faculty</b>  | <b>field of study</b> | <b>type</b>   | pierwszego stopnia                                     |
| Wydział Chemii  | Chemia                | <b>form</b>   | stacjonarne  |
|   |                       | <b>specjalty</b>  | chemia biomedyczna, chemia kosmetyków, chemia żywności |
|   |                       | <b>specialization</b>   | wszystkie  |
| <b>Teaching staff</b>   |                       |   |  |
| dr hab. Dariusz Wyrzykowski; dr inż. Krzysztof Żamojć; prof. UG, dr hab. Henryk Myszką; dr Aleksandra Bielicka-Giełdoń; prof. dr hab. Ewa Siedlecka; dr Aleksandra Tesmar; dr hab. Joanna Makowska, profesor uczelni; mgr Ola Grabowska; prof. dr hab. inż. Lech Chmurzyński; dr inż. Paulina Spisz |                       |   |  |
| <b>Forms of classes, the realization and number of hours</b>  |                       | <b>ECTS credits</b>   |  |
| <b>Forms of classes</b>   |                       | 8   |  |
| Auditorium classes, Laboratory classes, Lecture   |                       | classes - 75 h  |  |
| <b>The realization of activities</b>  |                       | tutorial classes – 25 h   |  |
| classroom instruction   |                       | student's own work – 100 h  |  |
| <b>Number of hours</b>  |                       | Total: 200 h - 8 ECTS   |  |
| Lecture: 30 hours, Laboratory classes: 30 hours, Auditorium classes: 15 hours   |                       |   |  |
| <b>The academic cycle</b>   |                       |   |  |
| 2022/2023 summer semester   |                       |   |  |
| <b>Type of course</b>   |                       | <b>Language of instruction</b>  |  |
| obligatory  |                       | polish  |  |
| <b>Teaching methods</b>   |                       | <b>Form and method of assessment and basic criteria for evaluation or examination requirements</b>                  |  |
| <ul style="list-style-type: none"> <li>- - calculations involving different aspects of inorganic chemistry</li> <li>- chemical experiments, analysis of obtained results and discussion</li> <li>- multimedia-based lecture</li> </ul>  |                       | <b>Final evaluation</b>   |  |
|   |                       | <ul style="list-style-type: none"> <li>- Graded credit</li> <li>- Examination</li> </ul>                            |  |
|   |                       | <b>Assessment methods</b>   |  |
|   |                       | <ul style="list-style-type: none"> <li>- written exam with open questions</li> <li>- written exam (test)</li> </ul> |  |
|   |                       | <b>The basic criteria for evaluation</b>  |  |

Lecture: positive note from an exam with 15-20 open questions:

91-100%: 5.0

81-90%: 4.5

71-80%: 4.0

61-70%: 3.5

51-60%: 3.0

< 51%: 2.0

Auditorium classes: positive note from two tests, final note is an average from notes from both tests

91-100%: 5.0

81-90%: 4.5

71-80%: 4.0

61-70%: 3.5

51-60%: 3.0

< 51%: 2.0

Lab classes: positive note from each lab test, final note is an average from notes from all the tests

91-100%: 5.0

81-90%: 4.5

71-80%: 4.0

61-70%: 3.5

51-60%: 3.0

< 51%: 2.0

#### Method of verifying required learning outcomes

#### Required courses and introductory requirements

##### A. Formal requirements

none

##### B. Prerequisites

none

#### Aims of education

- presenting basic issues in inorganic chemistry to students
- familiarize students with fundamental properties of the elements and inorganic compounds as well as their industrial role
- familiarize students with the basis of chemical calculations in the field of inorganic chemistry

#### Course contents

Topics of the lecture: periodicity and the chemistry of the elements, physicochemical properties of inorganic and coordination compounds. The following items are included: periodicity, chemical bonding, coordination compounds, types of chemical reactions, properties of chemical elements and their compounds. The groups of elements are presented in the following order: group 1, group 2, group 13, group 14, group 15, group 16, group 17, group 18, and d-elements (groups 3-12; first transition row, second transition row, and third transition row).

Topics of auditory classes: basic types of inorganic compounds, valence bond theory, hybridization and molecular geometry; molecular orbital theory; solid state bonds: ionic, covalent, metallic; metals, semiconductors and insulator; coordination compounds.

Topics of lab classes: investigation of physicochemical properties of the elements, inorganic and coordination compounds based on chemical experiments.

#### Bibliography of literature

Literature required to pass the course

Chemistry of the Elements, N. N. Greenwood, A. Earnshaw, Elsevier Science & Technology Books, 2005

General chemistry, Wendell H. Slabaugh, Thera D. Parsons, New York: John Wiley and Sons, 1966

College chemistry : an introductory textbook of general chemistry, Linus Pauling, Roger Hayward, San Francisco: W. H. Freeman and Company, 1950.

General chemistry, John H. Sechrist, Wendell H. Powers, Princeton, New Jersey : D. Van Nostrand Company, Inc., 1966

Basic inorganic chemistry, F. Albert Cotton, Geoffrey Wilkinson, New York: John Wiley & Sons, 1976.

Inorganic chemistry, Alan G. Sharpe, London : Longman Scientific Technical, New York : John Wiley & Sons, 1992

Inorganic chemistry: an industrial and environmental perspective, T. W. Swaddle, Thomas Wilson, San Diego: Academic Press, 1997

Extracurricular readings

1. Problem exercises for general chemistry, G. Gilbert Long, Forrest C. Hentz, New York: John Wiley & Sons, cop. 1978
2. General chemistry: principles and structure, James E. Brady, Gerard E. Humiston, SI version prepared by Henry Heikkinen, New York : John Wiley & Sons, 1982
3. The chemistry of the rare-earth elements, N. E. Topp, Amsterdam : Elsevier Publ. Co., 1965.

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

Students know how to correctly write names, formulas chemical compounds.  
 Students know properties and application of elements from blocks s, p, d, f, respectively and complex inorganic structures.  
 Students are able to define the basic rules of safety and hygiene during inorganic chemistry reactions.

**Skills**

Students plan and select the right equipment and measuring apparatus, conduct observations and simple chemical measurements and chemical experiments in inorganic chemistry, analyze the results and make conclusions based on them.  
 Students explain similarities and differences in properties of elements, relations between structure of substances and their properties; notice causal links in chemical processes performed in different conditions, where typical chemical reactions occur; explain course of different phenomena from everyday life with the use of chemical knowledge in correlation with other sciences; interpret information, formulates conclusions and explain opinions.  
 Students have skills of drawing correct conclusions based on available data from different sources, interpret and analyze information connected with chemistry presented as text, tables, plots, schemes, figures

**Social competence**

Students are aware of existing connections between the environment, industry and chemistry.  
 Students have the appropriate habits of work in the inorganic chemistry laboratory, in particular with toxic and caustic substances.  
 Students are acting in accordance with the principles of occupational health and safety. Students are able to identify their level of knowledge and skills and understand the necessity of life-long learning in organic chemistry and personal development.

**Contact**

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