



Subject card

| | | | | | | | |
|---|--|--|---|-------------------------------------|---------|---|-----|
| Subject name and code | Inorganic Chemistry, PG_00054688 | | | | | | |
| Field of study | Biotechnology | | | | | | |
| Date of commencement of studies | October 2025 | | Academic year of realisation of subject | | | 2025/2026 | |
| Education level | first-cycle studies | | Subject group | | | Obligatory subject group in the field of study Subject group related to scientific research in the field of study | |
| Mode of study | Full-time studies | | Mode of delivery | | | at the university | |
| Year of study | 1 | | Language of instruction | | | Polish | |
| Semester of study | 2 | | ECTS credits | | | 7.0 | |
| Learning profile | general academic profile | | Assessment form | | | exam | |
| Conducting unit | Department Of Inorganic Chemistry -> Faculty Of Chemistry -> Wydziały Politechniki Gdańskiej | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr hab. inż. Agnieszka Pladzyk | | | | |
| | Teachers | | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 30.0 | 15.0 | 45.0 | 0.0 | 0.0 | 90 |
| | E-learning hours included: 0.0 | | | | | | |
| Learning activity and number of study hours | Learning activity | Participation in didactic classes included in study plan | | Participation in consultation hours | | Self-study | SUM |
| | Number of study hours | 90 | | 10.0 | | 75.0 | 175 |
| Subject objectives | To achieve, through lectures, exercises and laboratories, to the understanding and ability to use basic inorganic chemistry, necessary for understanding natural processes and planning experiments in chemistry and biotechnology | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | | Method of verification | |
| | K6_U03 | | Student is able to plan and carry out simple experiments based on basic techniques such as precipitation, filtration, etc., which allow the identification of ions and chemical compounds | | | [SU1] Assessment of task fulfilment [SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject | |
| | K6_U02 | | Student can apply the rules of general and inorganic chemistry to predict the nature of intermolecular interactions determining the properties of biomolecules. | | | [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment | |
| | K6_W02 | | Student have the necessary knowledge about the elements and their simple compounds, which allows a rational analysis of the properties of biomolecules. | | | [SW1] Assessment of factual knowledge | |

| | | | |
|--|---|--|-------------------------------|
| Subject contents | LECTURE: 1. Types of inorganic reactions: redox reactions, proton transfer (acid-base equilibria), ligand transfer (precipitation reactions, complexation reactions). 2. Equilibria in electrolyte solutions (acids, bases, buffers, hydrolysis of salts). 3. Review of basic classes of binary compounds of the s, p and d blips of the periodic table 4. Essential trace and ultra trace elements, bio-molecules, metalloproteins-selected examples. EXERCISES-Practical calculations: 1. Equilibria in aqueous electrolyte solutions. Ion concentrations and pH of solutions of weak and strong acids and bases. The effect of a common ion. 2. Buffer solutions. Hydrolysis of salts. 3. Solubility and solubility product. Equilibria in solutions of complex compounds. LABORATORY - practical classes.Classical qualitative analysis course. 6 exercises including: 1. analysis of aqueous solutions of selected cations and anions. 2. analysis of inorganic substances: metal, non-metal, oxide, acid, base, salt, 3. study of the properties of buffer solutions and aqueous solutions of inorganic salts. | | |
| Prerequisites and co-requisites | | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Exercises - three written tests during semester | 60.0% | 25.0% |
| | Laboratory - short tests and detailed reports | 45.0% | 25.0% |
| | Written exam | 60.0% | 50.0% |
| Recommended reading | Basic literature | <ul style="list-style-type: none">• A. Bielański Chemia nieorganiczna, PWN wydania z ostatnich lat;• P.A. Cox Krótkie wykłady, chemia nieorganiczna, PWN 2003;• L. Jones, P. Atkins, L. Leroy, Chemia ogólna, Wydawnictwo naukowe PWN 2020, wydanie II;• Skrypty uczelniane: J. Prejzner: Chemia nieorganiczna. Laboratorium Wydawnictwo PG, Gdańsk 2004.• Chemia ogólna i nieorganiczna ćwiczenia rachunkowe Praca zbiorowa pod redakcją A. Okuniewskiego, Wydawnictwo PG, Gdańsk. (2019) | |
| | Supplementary literature | <ul style="list-style-type: none">• N.N. Greenwood, A. Earnshaw Chemistry of the elements Pergamon, wyd. II (2005);• C.E. Housecroft, A.G. Sharpe Inorganic chemistry, Pearson, Prentice Hall; wyd I (2001), II (2005) lub III (2008); | |
| | eResources addresses | Adresy na platformie eNauczanie: | |
| Example issues/ example questions/ tasks being completed | <ol style="list-style-type: none">1. Write the dissociation equations of orthophosphoric(V) and orthoboric(III) acid. In each equation, indicate the acid and base according to Brønsted or Lewis theory.2. Describe the industrial method for obtaining nitric acid.3. Describe the industrial method for obtaining ammonia.4. Describe the industrial method of obtaining sulfuric(VI) acid.5. Describe the industrial method for obtaining sodium carbonate.6. Describe the industrial method for obtaining sodium hydroxide.7. Nitrate and phosphate fertilizers - obtaining, properties and effects on living matter and the environment.8. Determine the dissociation constant of acetic acid9. Calculate the pH of the solution formed by mixing equal volumes of aqueous solutions of ammonia and a concentration of 0.3 M and formic acid with a concentration of 0.15M10. Give examples of the use of d-block elements11. Give examples of the occurrence of elements with important functions in proteins.12. What interactions are crucial to the activity of biological systems, such as proteins | | |
| Work placement | Not applicable | | |

Document generated electronically. Does not require a seal or signature.