


KAPITAŁ LUDZKI
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez
 Unię Europejską w ramach
 Europejskiego Funduszu
 Społecznego

UNIA EUROPEJSKA
 EUROPEJSKI
 FUNDUSZ SPOŁECZNY


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| Course title | | ECTS code | |
| Catalysis in inorganic chemistry | | 13.3.1204 | |
| Name of unit administrating study | | | |
| null | | | |
| Studies | | | |
| faculty | field of study | type | pierwszego stopnia |
| Wydział Chemii | Biznes chemiczny | form | stacjonarne |
| | | specjalty | wszystkie |
| | | specialization | wszystkie |
| Wydział Chemii | Chemia | type | pierwszego stopnia |
| | | form | stacjonarne |
| | | specjalty | chemia biomedyczna, chemia kosmetyków, analityka i diagnostyka chemiczna, chemia żywności |
| Wydział Chemii | Ochrona środowiska | specialization | wszystkie |
| | | type | pierwszego stopnia |
| | | form | stacjonarne |
| | | specjalty | wszystkie |
| | | specialization | wszystkie |
| Teaching staff | | | |
| dr hab. Dagmara Jacewicz, profesor uczelni; dr Joanna Drzeżdżon | | | |
| Forms of classes, the realization and number of hours | | ECTS credits | |
| Forms of classes | | 2 classes - 15 h tutorial classes - 15 h student's own work - 20 h TOTAL: 50 h - 2 ECTS | |
| Laboratory classes, Lecture | | | |
| The realization of activities | | | |
| classroom instruction | | | |
| Number of hours | | | |
| Lecture: 4 hours, Laboratory classes: 11 hours | | | |
| The academic cycle | | | |
| 2025/2026 summer semester | | | |
| Type of course | | Language of instruction | |
| an elective course | | English | |
| Teaching methods | | Form and method of assessment and basic criteria for evaluation or examination requirements | |
| <ul style="list-style-type: none"> - Lecture based on the multimedia presentation - Practical laboratory work - chemical experiments, analysis of obtained results and discussion. | | Final evaluation | |
| | | Graded credit | |
| | | Assessment methods | |
| | | Lecture, Laboratory classes – short test and report from performed chemical experiments. | |
| | | The basic criteria for evaluation | |

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|--|--|---------|-----|--------|-----|--------|-----|--------|-----|--------|-----|-------|-----|
| | <p>Lecture and Laboratory classes: positive note from an short test with 5 open questions:</p> <table> <tr><td>91-100%</td><td>5.0</td></tr> <tr><td>81-90%</td><td>4.5</td></tr> <tr><td>71-80%</td><td>4.0</td></tr> <tr><td>61-70%</td><td>3.5</td></tr> <tr><td>51-60%</td><td>3.0</td></tr> <tr><td>< 51%</td><td>2.0</td></tr> </table> <p>a. passing short test covering the material of the Lecture and Laboratory classes b. assessment criteria in accordance with the University of Gdańsk Study Regulations</p> | 91-100% | 5.0 | 81-90% | 4.5 | 71-80% | 4.0 | 61-70% | 3.5 | 51-60% | 3.0 | < 51% | 2.0 |
| 91-100% | 5.0 | | | | | | | | | | | | |
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| 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 | | | | | | | | | | | | | |
| <p>A. Formal requirements lack</p> <p>B. Prerequisites lack</p> | | | | | | | | | | | | | |
| Aims of education | | | | | | | | | | | | | |
| <ul style="list-style-type: none"> - familiarize students with the main aspects of mechanisms of action of catalysts in inorganic chemistry - familiarize students with the application of catalysts in inorganic chemistry in practice - presenting the homogeneous and heterogeneous catalysts - familiarize students with the methods of synthesis of homogeneous and heterogeneous catalysts in inorganic chemistry | | | | | | | | | | | | | |
| Course contents | | | | | | | | | | | | | |
| <p>The aim of the course is to understand of the mechanisms of action of catalysts in inorganic chemistry, as well as to learn their application in practice. Laboratory exercises include learning and synthesis of homogeneous and heterogeneous catalysts in inorganic chemistry, conducting catalytic reactions with the participation of selected catalysts and inhibitors, and also evaluation of their operation under the influence of changing reaction conditions.</p> | | | | | | | | | | | | | |
| Bibliography of literature | | | | | | | | | | | | | |
| <p>Literature required to pass the course</p> <p>D. Astruc, „Organometallic Chemistry and Catalysis”, Springer, 2007.</p> <p>R. van Eldik, C. Hubbard, “Advances in Inorganic Chemistry” vol. 65, Elsevier, 2013.</p> <p>C. Housecroft, “Inorganic Chemistry”, Pearson, 2018.</p> <p>Extracurricular readings</p> <p>M. A. Vannice “Kinetics of Catalytic Reaction”, Springer, 2005.</p> | | | | | | | | | | | | | |
| The learning outcomes (for the field of study and specialization) | Knowledge | | | | | | | | | | | | |
| <p>Chemical Business:</p> <p>K_BCh_W02 enumerates laws and theories in chemistry, physics and mathematics necessary to formulate and solve simple engineering tasks</p> <p>K_BCh_U01 on the basis of the acquired knowledge, identifies, analyses and solves engineering tasks and problems in broadly understood chemistry</p> <p>K_BCh_U08 uses the chemical nomenclature and engineering terminology properly</p> <p>K_BCh_K02 works individually demonstrating initiative and independence in actions, and effectively cooperates in a team, performing various roles in it</p> <p>Chemistry:</p> <p>K_W02 describes in an advanced level the properties of elements</p> | <p>Student:</p> <ul style="list-style-type: none"> - knows chemical laws relating to chemical compounds (catalytic control chemical transformations) - knows the chemical nomenclature used to describe chemical compounds (homogeneous and heterogeneous catalysis) - understands the role of activation energy in catalytic chemical reactions - knows the methods of testing the effectiveness of catalysts (turnover frequency and turnover number) - knows the methods of catalysts preparation and methods of their physicochemical analysis - understands the need to conduct an experiment in order to obtain empirical data to explain the processes taking place | | | | | | | | | | | | |
| | Skills | | | | | | | | | | | | |
| | <p>Student:</p> <ul style="list-style-type: none"> - is active in planning an experiment regarding catalytic reactions - is able to synthesize catalysts and inhibitors for the needs of inorganic chemistry reactions - is able to draw conclusions from the conducted experiments, e.g. calculate turnover frequency and turnover number of catalysts - is able to synthesize catalysts on inorganic carriers | | | | | | | | | | | | |

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| <p>and the most important chemical compounds, enumerates the methods of their preparation and methods of analysis</p> <p>K_U02 performs analyses using experimental methods and draws conclusions based on them</p> <p>K_U04 plans and performs chemical experiments and analyses the results obtained</p> <p>K_U09 is able to learn independently</p> <p>K_K05 observes established procedures in laboratory work and is responsible for the safety of her/his and others' work</p> <p>Environmental Protection:</p> <p>K_OŚI_W04 explains at an advanced level the meaning and indispensability of empirical data in the description and interpretation of natural phenomena and processes (occurring in the environment)</p> <p>K_OŚI_U02 plans, selects appropriate research and measuring equipment and devices, performs physicochemical measurements and experiments; analyses the results and draws conclusions based on them</p> <p>K_OŚI_K02 works individually demonstrating initiative and independence in actions, and effectively cooperates in a team, performing various roles in it</p> <p>K_OŚI_K05 identifies the level of her/his knowledge and skills, demonstrates the need to update knowledge about the environment and its protection, demonstrates the need for continuous professional training and personal development</p> | <p>- is able to carry out reactions with the participation of a catalyst and an inhibitor as well as to optimize process conditions</p> |
| | <p>Social competence</p> <p>Student:</p> <ul style="list-style-type: none"> - engages in scientific discussions in group - is active in extending knowledge and understands the need for continuous increasing the level of knowledge and qualifications - is able to work in a safe way for all participants of the class group - can play various roles in the group when solving research problems and performing experiments |

Contact

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