

COURSE DESCRIPTION CARD

| Faculty of Civil Engineering and Environmental Sciences | | | | | | | | | | |
|---|--|----|----|---|----|----|---|---|------------------|--|
| Field of study | | | | | | | | Degree level and programme type | | |
| Specialization/ diploma path | | | | | | | | Study profile | academic profile | |
| Course name | Analytical chemistry | | | | | | | Course code | IS-FCEE-00227S | |
| | | | | | | | | Course type | Erasmus | |
| Forms and number of hours of tuition | L | C | LC | P | SW | FW | S | Semester | summer | |
| | | 15 | 30 | | | | | No. of ECTS credits | 4 | |
| Entry requirements | General chemistry | | | | | | | | | |
| Course objectives | The aim of the course is to learn students different classical analytical (titration methods, gravimetric analysis) and instrumental methods (such as spectroscopy or chromatography) used in the analysis of liquid samples. | | | | | | | | | |
| Course content | <p>CLASSES: Stoichiometric calculations performed during titration analysis; pH calculations; solubility product constant calculations; concentration conversion.</p> <p>LABORATORY: Determination of the most important physicochemical parameters of water samples including: water hardness, content of chloride ions, sulfate ions, nitrate ions, cations of various metals, selected organic compounds and many other by the use of weight method, titration, spectrophotometric, flame photometry, high performance liquid chromatography.</p> | | | | | | | | | |
| Teaching methods | classes – calculations; research laboratory | | | | | | | | | |
| Assessment method | classes – tests, colloquium; laboratory - reports, tests before each laboratory, colloquium | | | | | | | | | |
| Symbol of learning outcome | Learning outcomes | | | | | | | Reference to the learning outcomes for the field of study | | |
| LO1 | student knows the basic methods of physico-chemical analysis | | | | | | | IS-FCEE-00022_W07 | | |
| LO2 | student can use basic laboratory equipment, plan and carry out simple chemical experiments, interpret the obtained results, perform appropriate calculations and draw correct conclusions as well as develop documentation of completed experiment | | | | | | | IS-FCEE-00022_U02 | | |
| LO3 | student can obtain information from the scientific literature and other sources; properly use the acquired information, can verify them and interpret them | | | | | | | IS-FCEE-00022_U15 | | |

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| LO4 | student is ready to explain cognitive and practical problems, consults other people in the event of a problem | IS-FCEE-00022_K03 | |
| Symbol of learning outcome | Methods of assessing the learning outcomes | Type of tuition during which the outcome is assessed | |
| LO1 | test, colloquium | LC | |
| LO2 | colloquium, laboratory report | C, LC | |
| LO3 | test, colloquium, laboratory report | LC | |
| LO4 | colloquium | C, LC | |
| Student workload (in hours) | | No. of hours | |
| Calculation | attendance at classes | 15 | |
| | attendance at laboratory classes | 30 | |
| | preparation for tests, colloquiums; preparation of reports | 30 | |
| | attendance at consultations | 5 | |
| | TOTAL: | 80 | |
| Quantitative indicators | | HOURS | No. of ECTS credits |
| Student workload – activities that require direct teacher participation | | 50 | 2 |
| Student workload – practical activities | | 60 | 2 |
| Basic references | <p>M. Kalinowska, M. Samsonowicz, G. Świderski, R. Świsłocka, M. Walery, "Practical analytical techniques used to determine selected physicochemical indicators of water quality", Białystok University of Technology, 2021 https://wb.pb.edu.pl/2021/12/14/skrypt-dydaktyczny-praktyczne-techniki-analityczne-stosowane-do-okreslania-wybranych-fizykochemicznych-wskaznikow-jakosci-wody/</p> <p>Saternus M., Fornalczyk A., Chemistry for every student, Politechnika Śląska, Gliwice, 2013</p> <p>Chojnacki J., Dołęga A., Dręczewski B. Selected topics in general and inorganic chemistry, Politechnika Gdańska, Gdańsk, 2001</p> <p>Instructions for laboratory exercises, available at the Department of Chemistry, Biology and Biotechnology</p> | | |
| Supplementary references | <p>Crowe J., Bradshaw T., Chemistry for the Bioscience, Oxford University Press, Oxford, 2010.</p> <p>Housecroft C.E., Inorganic chemistry, Pearson Education, Harlow, 2008</p> | | |
| Organisational unit conducting the course | Department of Chemistry, Biology and Biotechnology | Date of issuing the programme | |
| Author of the programme | dr hab Monika Kalinowska, prof. PB | 10.01.2022 | |

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work,

S – seminar