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| **Course title**  Physical chemistry – ERASMUS  Chemia fizyczna – ERASMUS | | | **ECTS code**  13.3.1279 |
| **Name of unit administrating study**  Faculty Chemistry | | | |
| **Studies**   |  |  |  |  | | --- | --- | --- | --- | | **Field of study** | **Type** | **Form** |  | | Chemistry | Bachelor | Full-time studies |  | | Chemistry | Master | Full-time studies |  | | | | |
| **Teaching staff**  dr hab. Piotr Storoniak, prof. UG | | | |
| **Forms of classes, the realization and number of hours** | | **ECTS credits 4**  classes 30 h  tutorial classes 20 h  student’s own work 50 h  TOTAL: 100 h - 4 ECTS | |
| 1. **Forms of classes, in accordance with the UG Rector’s regulations**   laboratory classes | |
| 1. **The realization of activities**   In-class | |
| 1. **Number of hours**   30 h - lecture | |
| **The academic cycle**  summer | | | |
| **Type of course**  facultative | **Language of instruction**  English | | |
| **Teaching methods**  Laboratory experiments | **Form and method of assessment and basic criteria for evaluation or examination requirements** | | |
| **A. Final evaluation, in accordance with the UG study regulations**  course completion (with a grade) | | |
| **B. Assessment methods**  preparing final grade based on partial grades received during semester | | |
| **C. The basic criteria for evaluation** or exam requirements  Evaluation criteria in accordance with the UG Studies Regulations; | | |
| **Required courses and introductory requirements**  no requirements | | | |
| **Aims of education**  Familiarization of students with:  - description of reversible processes,  - functioning of nature on the basis of thermodynamics,  - physicochemical description of the adsorption phenomena,  - phenomenological description of chemical changes on the ground of chemical kinetics,  - description and applications of catalysis phenomena,  - description and use of electrochemical processes. | | | |
| **Course contents**  Doing experiments in laboratory:  - determining dissociation constant on the basis of spectroscopy measurements  - calculations based on the Lambert-Beer law  - applications of the spectroscopic measurements  - principle of operation of the UV-VIS spectrophotometer  - dipole moment vs. molecular geometry, methods of determining of dipole moment  - polarizability, molar refractivity, refractive index  - calorimetric measurements (heat of combustion, calorimetric bomb, plot of the dependence of the temperature vs time for calorimeter)  - phase diagrams, lever rule, fractional distillation of azeotropic and zeotropic mixtures | | | |
| **Bibliography of literature**  Peter Atkins, Julio de Paula - Physical Chemistry | | | |
| **Knowledge**  A student:  • has knowledge on the basic laws and theories of physical chemistry,  • knows how to properly describe the investigated physicochemical phenomena, using the language of higher mathematics,  • identifies the equipment that he/she was exposed to during study and is able to explain its operation rules. | | | |
| **Skills**  A student can:  • carry out the planned experiments in the laboratory,  • analyze and solve problems using the known laws and methods,  • correctly draw conclusions from the results of the measurements and prove their correctness on the basis of the available  literature,  • solve calculation problems using appropriate theories and formulas. | | | |
| **Social competence**  A student:  • can work independently,  • adhere to the safety rules during execution of experiments,  • comply with the rules concerning the executed experiments,  • can cooperate and interact in the group adopting various roles. | | | |