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| **Course title**Instrumental analysis – ERASMUSAnaliza instrumentalna – ERASMUS  | **ECTS code**13.3.1272 |
| **Name of unit administrating study** Faculty Chemistry |
| **Studies**

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| **Field of study** | **Type** | **Form** |  |
| Chemistry | Bachelor  | Full-time studies  |  |
| Chemistry | Master  | Full-time studies  |  |

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| **Teaching staff**dr hab. Grzegorz Romanowski  |
| **Forms of classes, the realization and number of hours**  | **ECTS credits 5**classes 45 htutorial classes 15 hstudent’s own work 65 hTOTAL: 125 h - 5 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**

45 h - laboratory |
| **The academic cycle**winter |
| **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**Writing test  |
| **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**• acquainting students with the principles of electroanalytical, spectroscopic and chromatographic methods as well as stages of the analytical process,• developing skills in basic instrumental analyzes and their statistical evaluation,• developing the skills of solving problems by yourself during chemical analysis**Convergent to:** analytical chemistry |
| **Course contents**Stages of the analytical process, methods of analytical measurement, development of results and theirstatistical assessment, spectroscopic methods (molecular spectroscopy: UV-Vis, IR, NIR; atomicspectroscopy), chromatographic methods (gas chromatography, high performance liquid chromatography,planar chromatography), electroanalytical methods (potentiometry, conductometry, coulometry,polarography, voltammetry, amperometric titrationBasics of laboratory work with apparatus, performing determinations and chemical analyzes related tospectroscopic methods (UV-Vis spectroscopy), chromatographic methods (gas chromatography) andelectroanalytical methods (potentiometry, conductometry, coulometry, polarography, voltammetry,amperometric titration). |
| **Bibliography of literature** Instrumental analysis |
| **Knowledge**1. Defines the basic laws in electroanalytical, spectroscopic and chromatographic methods.2. Describes the construction and operation of the apparatus used in the above methods.3. Selects the analytical method for a specific sample.4. Explains the principles of sample preparation for analysis.5. Explains the principles of analysis using various instrumental techniques.6. Recognizes the limitations of using each method. |
| **Skills**1. Uses basic formulas to calculate the amount of analyte.2. Carries out the measurement in accordance with the exercise instructions.3. Interprets the results in qualitative and quantitative aspects along with their statistical processing.4. Recognizes and operates the apparatus used in the analytical laboratory. |
| **Social competence**1. Is aware of the financial conditions of the selected instrumental method.2. Demonstrates an active attitude in the face of an analytical problem.3. Demonstrates the ability to critically assess the analysis and results obtained.4. Takes care of the apparatus and environment used (utilization of chemical waste water). |