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| **Course title**  Electrodiagnostics – ERASMUS  Elektrodiagnostyka – ERASMUS | | | **ECTS code**  13.3.1263 |
| **Name of unit administrating study**  Faculty Chemistry | | | |
| **Studies**   |  |  |  |  | | --- | --- | --- | --- | | **Field of study** | **Type** | **Form** |  | | Chemistry | Bachelor | Full-time studies |  | | Chemistry | Master | Full-time studies |  | | Environmental sciences | Bachelor | Full-time studies |  | | | | |
| **Teaching staff**  dr hab. Adam Sieradzan | | | |
| **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 or on-line | |
| 1. **Number of hours**   30 h - laboratory | |
| **The academic cycle**  summer | | | |
| **Type of course**  facultative | **Language of instruction**  English | | |
| **Teaching methods**  Laboratory | **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**  **Convergent to:** IT, digital chemistry, computer sciences, data analysis | | | |
| **Course contents**  Assembly, coding and testing of electronic systems used in the chemical diagnostics:   * Basis of Arduino microcontroler coding (variables, operator, conditions, loops and functions) * Arduiono computer computer comunication with use of Python scritps (advanced data with lists as example, matplotlib library for drawing plots, objective coding) * Analog and digital sensors with temperater and humidity sensors as an example * Assembly and calibration of alcohol sensor with use of Arudino and sensor based on reistance change with ris-ing ethanol vapor concentration. * Other sensors: methane and other flammable gases sensor, carbon oxide sensor * Assembly and calibration of colorimeter based on Arduino microcontroler, RGB diode and color sensor. Color sensoring and calibration following the Lamberta-Beera rule for selected die. | | | |
| **Bibliography of literature**  Phyton  Arduino for beginners | | | |
| **Knowledge**  1. Names and describes data types and structures based on the Python language and Arduino environment.  2. Distinguishes between Python language and Arduino environment control instructions | | | |
| **Skills**  1. Builds simple electronic circuits using an Arduino microcontroller.  2. Designs simple algorithms, writes them using Python and Arduino environment and then compiles and tests the obtained programs.  3. Uses self-built and programmed electronic circuits to conduct experiments. | | | |
| **Social competence**  1. Develops the ability to make precise and logical conclusions.  2. Learns the principles of safe, responsible and effective work with devices digital (microcontrollers).  3. Develops the ability to work in a team | | | |