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| **Course title**Electrodiagnostics – ERASMUS Elektrodiagnostyka – ERASMUS | **ECTS code**13.3.1263 |
| **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 |  |
| Environmental sciences | Bachelor | Full-time studies |  |

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| **Teaching staff**dr hab. Adam Sieradzan |
| **Forms of classes, the realization and number of hours**  | **ECTS credits 4**classes 30 htutorial classes 20 hstudent’s own work 50 hTOTAL: 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.
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| **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 |