



Subject card

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| Subject name and code | MONITORING AND ANALYTICS OF ENVIRONMENTAL POLLUTANTS, PG_00048657 | | | | | | |
| Field of study | Green Technologies | | | | | | |
| Date of commencement of studies | February 2023 | | Academic year of realisation of subject | | 2023/2024 | | |
| Education level | second-cycle studies | | Subject group | | Obligatory subject group in the field of study Subject group related to scientific research in the field of study | | |
| Mode of study | Full-time studies | | Mode of delivery | | at the university | | |
| Year of study | 1 | | Language of instruction | | English | | |
| Semester of study | 2 | | ECTS credits | | 6.0 | | |
| Learning profile | general academic profile | | Assessment form | | exam | | |
| Conducting unit | Department of Analytical Chemistry -> Faculty of Chemistry | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr hab. inż. Marek Tobiszewski | | | | |
| | Teachers | | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 15.0 | 0.0 | 45.0 | 0.0 | 15.0 | 75 |
| | E-learning hours included: 0.0 | | | | | | |
| Learning activity and number of study hours | Learning activity | Participation in didactic classes included in study plan | | Participation in consultation hours | | Self-study | SUM |
| | Number of study hours | 75 | | 5.0 | | 70.0 | 150 |
| Subject objectives | Aim of the subject is familiarization with the basic ideas of monitoring and environmental analytics. | | | | | | |

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| Learning outcomes | Course outcome | Subject outcome | Method of verification |
| | [K7_W04] is aware of the importance of environmental protection and has a detailed knowledge of chemical and biological threats to the environment, with particular emphasis on anthropogenic factors | has knowledge from environmental monitoring and basic environmental chemistry knowledge | |
| | [K7_K03] can consciously and supported by the experience to present your work, provide information in a manner commonly understood, to communicate, to make self-assessment and constructive criticism of the work of others, the reasons for different points of view | is able to use different sources of knowledge | |
| | [K7_W03] will have a detailed knowledge of the theoretical basis of methods and types of apparatus used in chemical analysis of environmental pollutants and the technology of cleaning and neutralization of industrial waste and wastewater management and the design and supervision of environmentally friendly technologies | knowledge on environmental monitoring | |
| | [K7_U04] can be used to formulate and solve engineering tasks analytical methods, simulation and experimental, can make a critical analysis of the methods of operation and evaluate the existing technical solutions, in particular equipment, facilities, systems, processes, services in the field of environmental technology and make a preliminary economic analysis of engineering activities undertaken | is able to apply analytical procedures | |
| Subject contents | Sources of information for analysis. Method of citation literature sources. Basic problems trace analysis. Range of concentrations of trace analysis. Separation and enrichment of trace elements. The general scheme of trace analysis. Developments in analytics and environmental monitoring. Analyst speciation. Bioanalytika and biomonitoring. Methods of sampling and preparation of environmental samples for analysis. Issues of representativeness. Technology pre-enrichment and isolation of contaminants from water and air. Sampling device. Preparation of samples. Selected methods and techniques of determination of air pollution, water and soil. Techniques of the final determinations. Detectors. The development results. The problem of calibration of measuring instruments. Methods of preparation of reference mixtures. The aggregate indicators for assessing environmental pollution. Elimination of background constituents on the results of the determinations. Assess the usefulness of summary indicators of the degree of environmental contamination. Characteristics and evaluation of commercial apparatus for control of environmental pollution. Basic groups of chemical methods for determining water pollution and soil. Quality assurance and control results (QA / QC). Validation of analytical methodologies. Reference materials. Laboratory: Determination of organic and inorganic environmental contaminants (heavy metals, TOC, PAHs, pesticides, TBT) in different matrices (water, wastewater, food) with the most modern analytical methods (GC-MS, HPLC, GC-DAI-ECD, CI, izatochoforeza). | | |
| Prerequisites and co-requisites | Knowledge of the theoretical foundations of instrumental techniques Knowledge of the course: Chemistry, Physical Chemistry | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | | 50.0% | 30.0% |
| | | 60.0% | 40.0% |
| | | 50.0% | 30.0% |
| Recommended reading | Basic literature | - | |
| | Supplementary literature | - | |
| | eResources addresses | Adresy na platformie eNauczanie: | |
| Example issues/ example questions/ tasks being completed | | | |
| Work placement | Not applicable | | |