GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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|---|---|---|---|
| Subject name and code | MONITORING AND ANALYTICS OF ENVIRONMENTAL POLLUTANTS, PG_00066000 | | |
| Field of study | MONITORING AND ANALYTICS OF ENVIRONMENTAL POLLUTANTS | | |
| Date of commencement of studies | February 2025 | Academic year of realisation of subject | 2025/2026 |
| Education level | second-cycle studies | Subject group | Obligatory subject group in the field of study<br>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 -> Wydziały Politechniki Gdańskiej | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr hab. inż. Marek Tobiszewski | |
| | Teachers | | |

**Lesson types**

| 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 | 10.0 | 65.0 | 150 |

**Subject objectives**

Aim of the subject is familiarization with the basic ideas of monitoring and environmental analytics.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [K7_U06] conducts a critical analysis of the functioning of existing technical solutions in the field of environmental protection technology, and a preliminary economic analysis of the engineering activities undertaken | is able to use environmental standards, is able to select standard procedures to determine the compliance of the environmental condition with standards | [SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu |
| [K7_U02] selects analytical, simulation and experimental methods for research and analysis of environmental pollution using appropriately selected equipment and software | understands the analytical techniques used in monitoring the state of the environment | [SU4] Ocena umiejętności korzystania z metod i narzędzi |
| [K7_K03] understands non-technical aspects and effects of graduates' activities, including the impact on the environment | is able to use different sources of knowledge | [SK5] Ocena umiejętności rozwiązywania problemów występujących w praktyce |
| [K7_W03] identifies equipment used in environmental pollution analysis, industrial waste purification and neutralization technology, and water and sewage management, necessary for designing and supervising environmentally friendly technologies | knowledge on environmental monitoring | [SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym |

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| 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. Bioanalityka 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 |
|---|---|---|
| | 60.0% | 30.0% |
| | 60.0% | 30.0% |
| | 60.0% | 40.0% |

Recommended reading

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| Basic literature | - |
| Supplementary literature | - |
| eResources addresses | |

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|---|---|
| Example issues/ example questions/ tasks being completed | |
| Practical activites within the subject | Not applicable |

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