


**KAPITAŁ LUDZKI**  
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez  
 Unię Europejską w ramach  
 Europejskiego Funduszu  
 Społecznego

**UNIA EUROPEJSKA**  
 EUROPEJSKI  
 FUNDUSZ SPOŁECZNY


<b>Course title</b>		<b>ECTS code</b>	
Environment monitoring		7.2.0481	
<b>Name of unit administrating study</b>			
null			
<b>Studies</b>			
<b>faculty</b>	<b>field of study</b>	<b>type</b>	pierwszego stopnia
Wydział Chemii	Ochrona środowiska	<b>form</b>	stacjonarne
		<b>specjalty</b>	wszystkie
		<b>specialization</b>	wszystkie
<b>Teaching staff</b>			
dr hab. Magda Caban, profesor uczelni; dr hab. Łukasz Haliński; prof. dr hab. Piotr Stepnowski; prof. UG, dr hab. Monika Paszkiewicz; dr Paulina Łukaszewicz; mgr Klaudia Godlewska; mgr Anna Topolewska; dr hab. Marek Gołębiowski, profesor uczelni; dr hab. Anna Białk-Bielińska, profesor uczelni; dr Hanna Lis; dr hab. Jolanta Kumirska, profesor uczelni			
<b>Forms of classes, the realization and number of hours</b>		<b>ECTS credits</b>	
<b>Forms of classes</b>		6	
Laboratory classes, Lecture		classes - 90 h	
<b>The realization of activities</b>		tutorial classes - 6 h	
classroom instruction		student's own work - h	
<b>Number of hours</b>		TOTAL: 150 h - 6 ECTS	
Lecture: 45 hours, Laboratory classes: 45 hours			
<b>The academic cycle</b>			
2023/2024 summer semester			
<b>Type of course</b>		<b>Language of instruction</b>	
obligatory		polish	
<b>Teaching methods</b>		<b>Form and method of assessment and basic criteria for eveluation or examination requirements</b>	
- conducting experiments - multimedia-based lecture		<b>Final evaluation</b>	
		- Graded credit - Examination	
		<b>Assessment methods</b>	
		- written exam with open questions - (mid-term / end-term) test - written exam (test) - graded course credit based on individual grades obtained during the semester	
		<b>The basic criteria for evaluation</b>	

The basic criteria for evaluation

- Lecture
  - a requirement for positive grade is to obtain a min. 51% of points from the exam covering the scope of material carried out during lectures and laboratory exercises
  - the negative grade can be improved by an additional exam in the material carried out during lectures and laboratory exercises (min. 51% of points available)
- Laboratory exercises
  - The grade will be a weighted average of grades from the final colloquium of all laboratory material (40%), partial tests (40%) and reports (20%).
  - negative grade can be improved by an additional colloquium from the material covering the entire range of exercises (min 51% of points possible)

### Method of verifying required learning outcomes

#### Required courses and introductory requirements

##### A. Formal requirements

Formal requirements General biology, General chemistry, Analytical chemistry

##### B. Prerequisites

Prerequisites

Knowledge of physicochemical properties of chemical compounds important in their determination, theoretical foundations of analytical methods

#### Aims of education

Aims of education

- To familiarize students with all issues listed in the lecture program content
- To familiarize students with basic information on environmental monitoring systems, the type of water, soil and atmosphere pollution, methods of measuring pollution in environmental samples
- To familiarize students with the basics of biological monitoring, including maritime specificity
- Introducing students to the basics of calculations necessary for the correct interpretation of results
- Developing the skills of design of the analytical process and solving the problem during measurements

#### Course contents

Course contents

Lecture topics: General information about the objectives and principles of environmental monitoring, National Environmental Monitoring, national and international monitoring networks, collection and processing of environmental data. Quality standards for elements of the environment. Methods of measuring impurities (reference methods), spectroscopic and chromatographic methods, titration methods and others. Processing of analytical data and their statistical evaluation. Standardization of methods and laboratories. The principles of integrated monitoring. The role of remote sensing and GIS. Biological monitoring. Environmental monitoring of the Baltic Sea.

Laboratory issues: Preparation of environmental samples for proper analysis (extraction, liquid chromatography). Analysis of environmental pollution by selected techniques: titration analysis, UV / Vis spectroscopy, thin layer chromatography. Air quality assessment based on measurement results obtained at an air monitoring station.

#### Bibliography of literature

Bibliography of literature

Literature required to pass the course

Stepnowski P., Synak E., Szafranek B., Kaczyński Z. Monitoring i analityka zanieczyszczeń w środowisku, Wydawnictwo UG, Gdańsk 2010.

Stepnowski P., Synak E., Szafranek B., Kaczyński Z. Monitoring i analityka zanieczyszczeń w środowisku, Wydawnictwo UG, Gdańsk 2010.

Extracurricular readings

Namieśnik J., Chrzanowski W., Szpinek P. (Red.) Nowe Horyzonty i Wyzwania w Analityce i Monitoringu Środowiska, CDAMŚ Gdańsk, 2003.

Staszewski R. Kontrola chemicznych zanieczyszczeń środowiska, Podstawy teoretyczne z ćwiczeniami laboratoryjnymi, Politechnika Gdańska, Gdańsk, 1990.

Namieśnik J. Metody instrumentalne w kontroli zanieczyszczeń środowiska, Politechnika Gdańska, Gdańsk, 1992.

Kocjan R. Chemia analityczna. Podręcznik dla studentów. Tom 2. PZWL, Warszawa, 2000.

Szczepaniak W., Metody instrumentalne w analizie chemicznej, PWN, Warszawa, 1996.

#### The learning outcomes (for the field of study and specialization)

**Knowledge**

**Skills**

**Social competence**

#### Contact

magda.caban@ug.edu.pl