KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego

UNIA EUROPEJSKA
EUROPEJSKI FUNDUSZ SPOŁECZNY

Course title	ECTS code
Chemical processes in and between the atmosphere, seawater and sediment of the marine environment	not defined

Name of unit administrating study

Faculty of Oceanography and Geography

Studies

faculty	field of study		
Faculty of Oceanography and Geography	Oceanography	type	second tier studies (MA)
		form	full-time
		specialty	all
		specialization	all
Faculty of Oceanography and Geography	Oceanography	type	first tier studies (BA)
		form	full-time
		specialty	all
		specialization	all

Teaching staff

prof. UG, dr hab. Anita Lewandowska; prof. UG, dr hab. Bożena Graca; prof. UG, dr hab. Magdalena Bełdowska; prof. UG, dr hab. Dorota Burska; prof. UG, dr hab. Katarzyna Łukawska-Matuszewska

Forms of classes, the realization and number of hours

Forms of classes

Wykład (to translate), Ćw. laboratoryjne (to translate)

The realization of activities

lectures in the classroom, outdoor activities

Number of hours

Ćw. laboratoryjne (to translate): 75 hours, Wykład (to translate): 30 hours

ECTS credits

6
Lecture: 30 h (2 ECTS)
Workshop: 75 h (4 ECTS)
Students' own work: 20 h (1 ECTS)

2021/2022 summer semester

Type of course

elective (to translate)

Language of instruction

english

Teaching methods

- Lecture
- Research project, experiments, work in gropus, text analysis and discussion

Form and method of assessment and basic criteria for eveluation or examination requirements

Final evaluation

- Zaliczenie na ocenę (to translate)
- Egzamin (to translate)

Assessment methods

Lecture: written test and attendance to the lecture
Workshop: workshop attendance, class tests, reports, homework and final project (presentation / poster / portfolio)

The basic criteria for evaluation

Lecture:
- attendance to the lecture,
- grade from the test.

Workshop:
- workshop attendance,
- class tests,
- homework and final project (presentation / poster / portfolio)

Sposób weryfikacji założonych efektów kształcenia (DO TŁUMACZENIA)

Required courses and introductory requirements

A. Formal requirements

None

B. Prerequisites

1. Knowledge of the English language at an intermediate level.
2. Basics of chemical oceanography and marine chemistry.

Aims of education

The course aims at familiarising students with chemical processes occurring in the boundary layers between the atmosphere, sea and sediments. Fluxes of carbon, nitrogen, phosphorus and toxic metals (e.g. mercury, lead, cadmium) as well as the importance of interactions between the identified components of the environment will be discussed. The fundamental course issues will be associated with the present day problems of environment pollution.

Course contents

Lecture: Introduction to atmospheric chemistry. Carbon, nitrogen and phosphorus in the air. Microlayer of the sea. Role of the sea and land in creating the chemical composition of aerosols in the coastal zone. Wet and dry deposition of aerosols and gases to the seawater. Influence of the atmosphere on the seawater and sediment quality. Aerotoxins. Exchange of aerosols and gases between the sea-land and the atmosphere. Introduction to bottom sediment chemistry. Tools used to collect bottom sediment and pore water samples. Exchange of dissolved constituents and gases in the sediment-water boundary layer. Preliminary information on the toxicity of mercury, lead and cadmium in the marine environment. Toxic metals in the atmosphere, including gases, aerosols, dry and wet deposition. Toxic metals in seawater, including the coastal and offshore zone. Toxic metals in sediments today and in the past.
Workshop: Atmospheric field experiment. Atmospheric laboratory course / chemical analysis of sea microlayer and air samples. Calculation of chosen aerosol species and gas fluxes between the air and the sea microlayer. Sampling and chemical analysis of sediments and pore water. Estimation of fluxes of dissolved constituents at the sediment-water interface. Suspension field experiment. Chemical analysis of C, N, P, Si in particulate matter. Calculation of the vertical particulate C, N, P, Si flux. Preparation of environmental samples to analyse toxic metals: mercury and lead. Analysis of mercury and lead concentrations in environmental samples. Toxic metals in air, water and sediments of the coastal zone.

Bibliography of literature

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P7U_W: [K_W01]; [K_W02]; [K_W04]
P7U_U: [K_U01]; [K_U03]; [K_U04]; [K_U05]
P7U_K: [K_K02]; P7S_KR: [K_K03]; P7S_KK: [K_K04]

Knowledge

[K_W01] Students acquire in-depth knowledge, understand and correctly describe the chemical processes in the contact zone of the atmosphere, water and sediments.
[K_W02] Students consolidate the theoretical basis of knowledge in the field of carbon, nitrogen and phosphorus and toxic metal (like mercury, lead, cadmium) cycles in contact zones. Students understand, describe and discuss various global, regional and local air, water, sediment and pore water contamination problems in a global and societal context (impact on the society, environment and human health).
[K_W04] Studens know basic methods and techniques in chemical analysis of marine environment.

Skills

[K_U03] Students conduct observations and chemical measurements in the laboratory and in the field. Students use the skills and modern environmental science techniques and tools necessary for successful measurements in the field.
[K_U05] Students use the available sources of information, including information technology, multimedia and Internet resources during a speech / poster / portfolio.
[K_U01] Students apply the theoretical knowledge learned in the lecture to interpret

	the empirical results obtained in the field and in the laboratory and to perform simple scientific tasks or analyses under the supervision of an academic advisor. [K_U04] Students use mathematical, statistical and scientific knowledge to calculate, understand and interpret fluxes of pollutants between air, seawater and sediments.
	Social competence
	[K_K03] Students communicate scientific and technical information effectively while working in groups. Students effectively organize their work in the lab and during the field campaign, and critically evaluate the level of progression. [K_K04] Students understand the importance of posing questions and problems in order to broaden their knowledge in the field of marine sciences. [K_K02] Students understand the meaning of intellectual honesty and value it while preparing a presentation / poster / portfolio.

Contact

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