UNIWERSYTET GDAŃSKI

Course title Chemiczna i radiochemiczna analiza środowiska / Chemical and radiochemical environmental analysis	**ECTS code** 13.3.0702

Name of unit administrating study

Faculty of Chemistry

Studies

Field of study	Type	Form	
Chemistry	Master	Full-time studies	

Teaching staff
Prof dr hab. Bogdan Skwarzec

Forms of classes, the realization and number of hours	**ECTS credits**
A. Forms of classes, in accordance with the UG Rector's regulations Lecture	classes - 30 h Tutorial classes - 15 h Student's own work - 30 h TOTAL: 75 h - 5 ECTS
B. The realization of activities In-class learning	
C. Number of hours Lecture 30 h	

The academic cycle
2019/2020 summer semester

Type of course obligatory	**Language of instruction** Polish
Teaching methods • lecture with multimedial presentation	**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** Written exam **The basic criteria for evaluation** Obtaining a positive assessment of the written credit cosisting of open questions covering only the issues listed in the lecture

Required courses and introductory requirements

A. Formal requirements
The student should have completed a monographic lecture „Environmental radiochemistry and radiological protection" at the second degree studieds.

B. Prerequisites
Students are required to complete obligatory subjects: completion of first degree chemical studies with specialization in chemical analytics and diagnostics, food chemistry, cosmetics chemistry and environmental chemistry
The monographic lecture is intended for students of chemistry of the second degree and specialization in chemical analytisc and diagnostics, environmental chemistry and environmental technology.

Aims of education
- To familiarize students with the basics and methods of chemical and radiochemical analysis of the environmental.
- To familiarize students with the applications of chemical and radiochemical analysis in studies of terrestrial and marine environment.
- To familiarize students with the validation of chemical and radiochemical methods.

Course contents

1. Trace analysis in environmetal studies, research methods and technique.
2. Radioactive elements in nature, radiometry (gamma, beta and alpha spectrometry) and sources of radioactive contamination in the natural environment
3. Validation in chemical and radiochemical analysis and criteria for evaluation of analytical results.
4. Speciation and speciation analysis of toxic and radiotoxic elements.
5. Determination of radioactive gamma, beta and alpha radionuclides in natural samples.

Bibliography of literature

A. Literature required to pass the course:

Primary literature:

A.1. Literature used during classes:

- Skwarzec B., Polon, uran i pluton w ekosystemie południowego Bałtyku, Rozprawy i monografie, 6, Instytut Oceanologii PAN, Sopot 1995.
- Skwarzec B., Radiochemia środowiska i ochrona radiologiczna, Wydawnictwo DJ s.c, Gdańska, 2002.
- Skwarzec B., Analysis of radionuclides, In: Handbook of trace analysis: fundamentals and applications, Ed: I. Baranowska, Springer, Switzerland, Charter 15, 431-453, 2015, ISBN 978-3-319-19613-8.

A.2. Literature for individual studies

- Analiza śladowa, pod redakcją I. Baranowskiej, Wydawnictwo MALAMUT, Warszawa, 2013.
- G.W van Loon, S.J. Duffy: Chemia środowiska. Wydawnictwo PWN (2008). ISBN: 978-83-01-15324-3.

B. Extracurricular readings:

Ćwiczenia rachunkowe z chemii analitycznej pod redakcja Z. Galusa, PWN, Warszawa 2009,
M. Wesołowski. K. Szefer, D. Zimna – Zbiór zadań z chemii analitycznej, Warszawa 2002.
A. Cygański, B. Ptaszyński, J. Krystek – Obliczenia w chemii analitycznej, WN-T, Warszawa 2000

Knowledge

After completing the course, each student:

1. Defines basic concepts of chemical and radiochemical environmental analysis.
2. Knows and understands analytical and spectroscopic methods used for the quantification of elements and radionuclides.
3. Understands the concept and application of validation in environmental analysis and distinguishes and applies the basic criteria for assessing analytical results.

Social competence

After completing the course, each student:

1. Understands the need and further education in the field of chemical and radiochemical analysis.
2. Knows the basic principles of safe work with toxic substances and radioactive isotopes.
3. Makes the public aware of the impact of radioactivity and toxic substances on human life.
4. Demonstrates the most independent, active approach to problems and creativity in independent and team work.