UNIWERSYTET GDAŃSKI

Course title
Inżynieria środowiska/Environmental engineering

ECTS code
7.2.0520

Name of unit administrating study

Faculty of Chemistry

Studies

Field of study	Type	Form	
Environmental Protection	Bachelor	Full-time studies	

Teaching staff
Dr inż. Ewelina Grabowska

Forms of classes, the realization and number of hours

A. Forms of classes, in accordance with the UG Rector's regulations
lecture, audytorium classes, laboratory classes

B. The realization of activities
In-class learning

C. Number of hours
lecture 30 h, audytorium classes 15 h, laboratory classes 30 h

ECTS credits

classes - 75 h
tutorial classes 20 h
student's own work - 55 h
TOTAL: 150 h - 6 ECTS

The academic cycle
Third year, winter semester

Type of course
obligatory

Language of instruction
Polish

Teaching methods

Lectures including multimodal presentations
Case studies
Laboratory experiments

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), exam

B. Assessment methods
written exam with open questions

The basic criteria for evaluation
• positive note of the written exam consisting of open questions covering the issues listed in the content of the lecture and laboratory exercises, grading scale in accordance with the Regulations of the University of Gdańsk
• grade from laboratory exercises will be the average of grades obtained from laboratory exercises and the final test according to the scale in accordance with the University of Gdańsk Studies Regulations
Completion of laboratory exercises will be based on the performance of all laboratory exercises provided for in the academic year and obtaining at least 51% of points for cards (8 passes of 5 points), performance of the experimental part covered by the program of classes, activity and cooperation in the group, and compliance with the principles of work safety in chemical laboratory (6 exercises with 2 points each) and preparation of results obtained in the experimental part (6 reports with 3 points each) and obtaining more than 51% of points from the final test covering the abovementioned scope

Required courses and introductory requirements

A. **Formal requirements** Matematyka, Fizyka, Chemia ogólna, Chemia nieorganiczna, Chemia analityczna, Biologia, Hydrobiologia, Ekologia, Prawo w ochronie środowiska

B. **Prerequisites** describing the course of natural and anthropopressory physical, chemical and biological processes occurring in the natural environment; application of basic methods and techniques of work in a chemical laboratory; defining and searching for applicable legal regulations and instruments of applying the law in environmental protection

Aims of education

-Introduce students with the basic technological processes used in water treatment

-Introduce students with the basic processes of wastewater treatment and treatment of sewage sludge used in municipal wastewater treatment plants and in industrial plants and the devices corresponding to these processes.

- Acquiring basic knowledge about the types and sources of air pollution and the principles of operation of waste gas purifying devices

Course contents

Lecture issues

Principles of green chemistry and green engineering. Types and sources of water, soil and air pollution. Water parameters. Municipal and industrial wastewater treatment technologies. Sewage sludge management methods. Classification of soil remediation methods. Physico-chemical methods of soil reclamation. Thermal methods of soil remediation. Air dedusting methods. Dry dedusting. Wet dedusting. Odor control. NOx control. NO_x removal from flue gases. Flue gas desulphurization. Air protection by desulfurization of fossil fuels. CO_2 emission control. Photocatalytic methods of air purification.

B. Laboratory classes

Mechanical wastewater treatment; Physico-chemical compost testing. Water iron removal. Application of sorption and decarbonisation. Desulphurisation of gases / Remediation of oily soils.

C. Auditorium exercises:

Solving accounting tasks

Bibliography of literature

A. **Literature required to pass the course**

1. Instructions for auditorium-laboratory exercises developed by employees of the Department of Environmental Technology
2. Hermanowicz I., Dojlido J., Fizyczno-chemiczne badania wody i ścieków, Arkady, Warszawa 1999
3. A.L. Kowal, M. Świderska-Bróż, Oczyszczanie wody, Wydawnictwo Naukowe PWN, Warszawa 2009
4. Dymaczewski Z. (red), Poradnik eksploatatora oczyszczalni ścieków, PZIiTS, Poznań 2011
5. Bartkiewicz B., Oczyszczanie ścieków przemysłowych, Wydawnictwo Naukowe PWN, Warszawa 2007
6. Jędrczak A., Biologiczne przetwarzanie odpadów, Wydawnictwo Naukowe PWN, Warszawa 2007
7. Imhoff K., Kanalizacja miast i oczyszczanie ścieków, Projprzem-EKO, Bydgoszcz 1996
8. Warych J., Oczyszczanie przemysłowych gazów odlotowych, WNT Warszawa 1994

B. **Extracurricular readings**