

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		ECTS credits	
A. Forms of classes, in accordance with the UG Rector's regulations lecture, audytorium classes, laboratory classes		classes - 75 h tutorial classes 20 h student's own work - 55 h TOTAL: 150 h - 6 ECTS	
B. The realization of activities In-class learning			
C. Number of hours lecture 30 h, audytorium classes 15 h, laboratory classes 30 h			
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 <ul style="list-style-type: none"> • 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. NO_x control. NO_x removal from flue gases. Flue gas desulphurization. Air protection by desulfurization of fossil fuels. CO₂ 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. Świdorska-Bróż, Oczyszczanie wody, Wydawnictwo Naukowe PWN, Warszawa 2009
4. Dymaczewski Z. (red), Poradnik eksploatatora oczyszczalni ścieków, PZLiTS, Poznań 2011
5. Bartkiewicz B., Oczyszczanie ścieków przemysłowych, Wydawnictwo Naukowe PWN, Warszawa 2007
6. Jędrzak 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