

Course title Technologia oczyszczania wód i ścieków/Technology of water and waste water treatment		ECTS code 13.3.0463	
Name of unit administrating study Faculty of Chemistry			
Studies			
Field of study	Type	Form	
Chemistry	Master	Full-time studies	
Dr inż. Ewelina Grabowska-Musiał			
Forms of classes, the realization and number of hours		ECTS credits	
A. Forms of classes, in accordance with the UG Rector's regulations lecture, laboratory classes		classes 45 h Tutorial classes 10 h Student's own work 45 h TOTAL: 100 h - 4 ECTS	
B. The realization of activities In-class learning			
Number of hours lecture 15 h, laboratory classes 30 h			
The academic cycle 2019/2020 winter semester			
Type of course obligatory		Language of instruction Polish	
Teaching methods Lectures including multimodal presentations Designing chemical experiments Laboratory experimants		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 test exam	
		C. The basic criteria for evaluation or exam requirements Exam - positive assessment of the written exam consisting of open questions covering the issues listed in the program content of the lecture and laboratory exercises, grading scale in accordance with the regulations of studies at the University of Gdańsk Laboratory exercises average of grades obtained from laboratory exercises and the final test, the scale is in accordance with the University of Gdańsk Studies Regulations. Obtaining above 51% of points from laboratory exercises, i.e.: entrance tests covering the subject of performed experiments, preparation of the experimental part, preparation of results obtained in the experimental part (reports), activity and cooperation in the group, and compliance with the principles of work safety in the chemical laboratory and obtaining over 51% of points from the final test covering the abovementioned scope	
Required courses and introductory requirements			

basic chemistry, inorganic chemistry, organic chemistry
 knowledge of basic methods and devices for water treatment, wastewater treatment, basics of laboratory work and chemical analysis, the ability to experiment and solve problems independently

Aims of education

The aim of the course is to introduce the student to basic issues in the field of technology used in water and wastewater treatment processes. During the course, the student learns the sources of water pollution, quality indicators and technologies for removing pollution.

Course contents

A. Problems of the lecture

Definitions and basic concepts in the field of water and sewage management

1. Water treatment processes.
2. Methods for municipal and industrial wastewater treatment. Specificity of sewage from selected industries.
3. Household sewage treatment plants.
4. Parameters used in assessing the degree of pollution reduction.
5. Legal regulations regulating the correctness of wastewater treatment and water treatment processes.

B. Laboratory issues

Examples of technological processes used in wastewater and water treatment.

Bibliography of literature

A. Literature required to pass the course

A.2. Literature for individual studies

1. Kowal A. L., Świdorska-Bróż M., *Oczyszczanie wody*, Wydawnictwo Naukowe PWN, Warszawa 2007
2. Dymaczewski Z, Oleszkiewicz J.A., Sozański M.M., *Poradnik eksploatatora oczyszczalni ścieków*, PZLiTS, Poznań 1997
3. Kowal A., *Technologia wody*, Arkady, W-wa, 1995
4. Bortkiewicz B., 2002. *Oczyszczanie ścieków przemysłowych*. PWN, Warszawa
5. Nawrocki J. „Uzdatnianie wody” Wydawnictwo Naukowe PWN, Warszawa 2010
6. Anielak A. M. „Chemiczne i fizykochemiczne oczyszczanie ścieków” Wydawnictwo Naukowe PWN, Warszawa 2000

Knowledge

Student

1. lists types of water and wastewater pollution and sources of their formation
2. defines the parameters used to assess the quality of water and wastewater, describes the methods for their determination
3. draws diagrams of selected wastewater treatment plants and water treatment plants
4. explains the processes that occur during wastewater treatment and water treatment.
5. defines and characterizes objects and devices used for wastewater treatment and water treatment

Skills

Student

1. identifies the sources of waste water generation.
2. interprets types of pollutants in wastewater and describes possible methods of their removal.
3. explains the choice of water treatment methods for plumbing purposes depending on its physical and chemical characteristics.
4. explains the role of microorganisms in wastewater treatment and water treatment processes.
5. uses professional terminology
6. carries out laboratory tests in the field of water and wastewater treatment according to the instructions, prepares written reports on their implementation

Social competence

Student

- : complies with the safety rules in force in the chemical laboratory;
- . understands the need for further education.
- : cooperates in a team during laboratory exercises and developing results
- : shows creativity in independent and team work
- : recognizes the need to apply environmental engineering technologies in industrial plants in relation to water and wastewater management and improving the quality of human life.