

Technologies in environmental protection - course description

General information	
Course name	Technologies in environmental protection
Course ID	13.9-WB-OS2P-Tech_środ-S17
Faculty	Faculty of Biological Sciences
Field of study	Environmental Protection
Education profile	academic
Level of studies	First-cycle studies leading to Bachelor's degree
Beginning semester	winter term 2021/2022

Course information	
Semester	3
ECTS credits to win	4
Course type	obligatory
Teaching language	english
Author of syllabus	<ul style="list-style-type: none">prof. dr hab. Leszek Jerzak

Classes forms					
The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	30	2	-	-	Exam
Laboratory	30	2	-	-	Credit with grade

Aim of the course

The aim of the course is to familiarize students with the basic concepts, unit processes and technological methods used in water treatment for municipal and industrial purposes. Theoretical foundations of mechanical and biological treatment of municipal and industrial sewage. Methods of municipal waste treatment, reduction of pollutant emissions to the atmosphere

Prerequisites

High school level - chemistry, biology, ecology, biotechnology.

Scope

Lecture: Water, sources of supply, quality requirements, technological systems for water treatment. Sedimentation - theoretical foundations and application. Unit processes in water purification - theoretical foundations and application. Domestic and domestic wastewater - quantitative and qualitative characteristics. Mechanical wastewater treatment - theoretical foundations and technological systems. Biological oxygen treatment of wastewater - theoretical foundations and methods of implementation. Anaerobic wastewater treatment processes. Water treatment for industrial purposes. Purification of industrial wastewater. Waste - collection, disposal, use. Atmospheric air pollution, emission reduction. Exercises: Water balance for the city. Basic processes used in water treatment, technological concept of the water treatment plant - computational part and drawing part. Wastewater balance with the proposal of a technological purification series - technical description with a drawing part. Basic technological processes in wastewater treatment. Waste balance for the city - computational part. Waste balance for the city; selective waste collection - computational part.

Teaching methods

Lectures. Labs.

Learning outcomes and methods of their verification

Outcome description	Outcome symbols	Methods of verification	The class form
Knows the basic technologies used in water treatment, wastewater treatment and waste treatment.	<ul style="list-style-type: none">K1A_W93	<ul style="list-style-type: none">an evaluation test	<ul style="list-style-type: none">Lecture
Performs and carries out observations of processes occurring during water treatment and wastewater treatment.	<ul style="list-style-type: none">K1A_U28	<ul style="list-style-type: none">an evaluation test	<ul style="list-style-type: none">Laboratory
applies the self-education method and sees the need to learn and improve one's skills	<ul style="list-style-type: none">K1A_U11K1A_U17	<ul style="list-style-type: none">an evaluation test	<ul style="list-style-type: none">Lecture
knows and understands the basic processes and phenomena occurring during the treatment of water and sewage as well as on landfills.	<ul style="list-style-type: none">K1A_W93	<ul style="list-style-type: none">an evaluation test	<ul style="list-style-type: none">Laboratory
uses the acquired skills in a work environment and in other environments	<ul style="list-style-type: none">K1A_U26K1A_K20	<ul style="list-style-type: none">an evaluation test	<ul style="list-style-type: none">Laboratory

Outcome description	Outcome symbols	Methods of verification	The class form
uses literature sources and other sources (e-learning), can interpret and combine into a coherent whole information obtained.	• K1A_U08	• an evaluation test	• Lecture
he works in a group and organizes work in a specific scope, listens to the teacher's remarks and applies to his recommendations.	• K1A_U12	• an evaluation test	• Laboratory
explains the relationship between the state of the environment and human economic activity	• K1A_U61	• a pass - oral, descriptive, test and other	• Laboratory

Assignment conditions

Lecture - final exam, to which the student is admitted on the basis of the previous passing of the exercises, carried out in writing (the exam lasts 60 minutes). It is necessary to get 60% of positive answers to pass on a satisfactory grade.

Exercises - the condition for passing is to get positive grades from all the exercises planned for implementation as part of the exercise program. The following are subject to assessment: self-made water balance, technological concept of the water treatment plant, sewage balance, waste balance and tests testing knowledge - positive assessment over 60% of points obtained. The final grade is the arithmetic mean of partial grades.

Recommended reading

- Kowal A. L., Świdorska-Bróż M.: Oczyszczanie wody. Podstawy teoretyczne i technologiczne, procesy i urządzenia. Wydawnictwo Naukowe PWN, Warszawa 2007.
- Hermanowicz W.: Fizyczno-chemiczne badanie wody i ścieków. Wyd. Arkady, Warszawa 1999.
- Cywiński B., Gdula St., Kempa E., „Oczyszczanie ścieków miejskich” Arkady. Warszawa 1972
- Hartmann L: Biologiczne oczyszczanie ścieków, Wyd. Instalator Polski, W-wa 1996
- Imhoff K. i K.: Kanalizacja miast i oczyszczanie ścieków, Poradnik, Projprzem – Eko, Bydgoszcz 1997

Further reading

- Klimiuk E., Łebkowska M.: Biotechnologia w ochronie środowiska. PWN, Warszawa 2004.
- Schlegel H.G.: Mikrobiologia ogólna. Wydawnictwo Naukowe PWN. Warszawa 2004.
- Szklarczyk M., Ochrona atmosfery. Wydawnictwo UW-M, Olsztyn 2001
- Jędrzak A., Biologiczne przetwarzanie odpadów. PWN, Warszawa 2007
- Niemiecki zbiór reguł ATV-DVWK- 2002. Wyd. Seidel- Przywecki, Warszawa

Notes

Modified by dr Olaf Ciebiera (last modification: 19-05-2021 22:02)

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