



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Water Purification and Wastewater Treatment Technologies

Course

Field of study

Chemical Technology

Area of study (specialization)

-

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

IV/7

Profile of study

general academic

Course offered in

English

Requirements

elective

Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

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Wydział Technologii Chemicznej

ul. Berdychowo 4, 60-965 Poznań

tel. 61 665 3347

Responsible for the course/lecturer:

Prerequisites

Student has basic knowledge of general, inorganic, organic and analytical chemistry as a result of the first, second and third years of engineering studies. He has basic skills in general, inorganic, organic and analytical chemistry resulting from the course of the first, second and third year of engineering studies and is aware of the important role of water treatment for the environment with regard to the growing deficiencies of this life-giving substance.

Course objective

The purpose of the subject is to acquire basic knowledge in the field of different methods of water treatment and wastewater treatment.



Course-related learning outcomes

Knowledge

W1. Has detailed knowledge regarding water and wastewater quality indicators and the consequences of exceeding them. K_W03, K_W07

W2. Has knowledge related to the use of physical and chemical methods for water and wastewater treatment. K_W08

W3. Has knowledge regarding designing tap water treatment systems. K_W15

W4. Has knowledge about the construction and operation of municipal and industrial sewage treatment plants. K_W17

W5. He knows the methods of disposal and management of sewage sludge. K_W07

Skills

Student: gains knowledge and skills in the field of water treatment and wastewater treatment methods and processes:

U1 - the student knows the rules for the selection of wastewater treatment processes depending on the type of contaminants contained, knows the basic technologies using mechanical, chemical, membrane and biological methods. K_U01, K_U16

U2 - Can plan basic technological research on water and sewage. K_U03, K_U33

U3 - Can assess the efficiency of sewage treatment systems. K_04,

U4 - Can propose a block technological scheme for surface, underground and wastewater treatment. K_U08

U5 - Can critically analyze various water treatment options and the possibilities of using new techniques and technologies. K_030

Social competences

K1. Student broadens the awareness regarding the importance of water treatment and wastewater treatment technologies in environmental aspects and quality of life. K_01

K2. He knows the legal, financial, social and ecological consequences of exceeding the indicators of water and wastewater quality. K_01

K3. Has a sense of great responsibility for decisions related to the state of the environment. K_02



Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

At the last lecture, there will be a final test, closing the lecture course. The test (10-15 questions) will be in stationary form or on-line form on the e-kursy platform. Pass lecture: above 50% of points. During the lectures there is also the possibility of gaining points, which influence the final grade.

Programme content

1. Properties of water and concepts of its creation on Earth.
2. Characteristics of waters and sewage.
3. Physical, chemical and biological indicators of water quality
4. Surfactants as the main source of synthetic organic carbon in surface waters.
5. Biological and non-biological processes applied in water and wastewater treatment (neutralization, coagulation, flocculation, sedimentation, filtration, adsorption, oxidation processes, disinfection).
6. Water treatment technologies.
7. Wastewater treatment technologies.
8. The role of biological processes in wastewater treatment.
9. Construction and operation of a typical municipal sewage treatment plant.
10. Processes of neutralization and management of sewage sludge.
11. Household sewage treatment plants.

Teaching methods

Multimedia interactive lecture - students have the opportunity to ask questions, discuss and express their opinions also during the lecture.

Bibliography

Basic

1. Schroeder Edward D. Water and wastewater treatment McGraw-Hill, 1977.
2. Mu. Naushad. Life cycle assessment of wastewater treatment /Boca Raton ; London ; New York : CRC Press is an imprint of the Taylor & Francis Group, 2018.
3. Frank R. Spellman, Handbook of Water and Wastewater Treatment Plant Operations, CRC Press, 2020.



4. Noor, Zainura Zainon, Sabli, Noor Salehan Mohammad, Sustainable water treatment : innovative technologies / ed. by Zainura Zainon Noor and Noor Salehan Mohammad Sabli. CRC Press/Taylor & Francis, 2017.

5. Randtke Stephen J., Horsley Michael B., McGraw-Hill, Water treatment plant design / American Water Works Association, American Society of Civil Engineers. 2012.

Additional

Current publications and reports in the field of surface water treatment, sewage and water treatment.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	25	1,0
Student's own work (literature studies, preparation for test) ¹	25	1,0

¹ delete or add other activities as appropriate