

86S1-KJWIS

QUALITY CONTROL OF WATER AND WASTEWATER

ECTS: 3.0

HOURS PER SEMESTER/WEEK: LECTURES: 15/1; CLASSES: 30/2

FIELD OF THE STUDY: Chemistry

Level of study: First-cycle (Bachelor's degree) program

Course status: optional *

Year of the study: III

COURSE CONTENTS

LECTURES: Expressing concentrations and charges of substances, percentage and molar concentrations, converting concentrations, substance charges. Performing analysis of physicochemical parameters of water and wastewater in the laboratory and in the field. Acidity and alkalinity. Calculating the pH of water and wastewater. Calculating changes in water pH after coagulation. Calculating the concentration of dissolved oxygen in water and wastewater, determining percent saturation, calculating changes in oxygen concentration. Calculating water hardness, methods of expressing water hardness, unit conversion. Calculating the carbon dioxide content in water, free, equivalent, and aggressive carbon dioxide. Determining BOD₅, COD_{Cr}, total suspended solids, total nitrogen, total phosphorus in raw and treated wastewater.

CLASSES: Legal requirements for water quality based on their purpose and the quality of treated wastewater. Suitability of water for consumption and economic purposes. Sampling of water and wastewater for analysis. Sampling locations, timing, and frequency of sampling. Types of samples and equipment used for sample collection. Sample durability and storage. Sources of errors related to the sampling and handling stages of water and wastewater samples, principles and methods of preserving samples before further stages of the analytical process.

EDUCATIONAL PURPOSE: The objective of this subject is to familiarize students with the methods, techniques, and approaches for assessing the quality of water and wastewater.

LEARNING OUTCOMES

Knowledge. The student defines the parameters and describes the methods of their determination to assess the quality of water and sewage. He knows the principles of collecting and preparing water and sewage samples for physico-chemical analysis.

Skills. The student conducts laboratory tests of water and sewage quality and prepares reports on their implementation. Uses applicable legal acts in assessing the quality of water and sewage.

Social competences. The student works in a team while performing laboratory tests. He connects the importance of reliable physico-chemical analyses with the proper assessment of the quality of the environment.

TEACHING FORMS AND METHODS

Lectures. Lecture with multimedia presentation, discussion and questioning by students.

Classes. Individual and group work.

FORM AND CONDITIONS FOR VERIFICATION OF LEARNING OUTCOMES

Lectures. written/oral test.

Classes. Practical exercises: Report - The student prepares a report on the implementation of exercises.

BASIC LITERATURE

1) Szczepaniak W. 1999. Metody instrumentalne w analizie chemicznej. PWN Warszawa, 2) Hermanowicz W. 2003. Fizyczno-chemiczne badanie wody i ścieków. Wydawnictwo Arkady Warszawa, 3) Kowal A.L., Świdorska-Bróż M. 2007. „Oczyszczanie wody”, Wydawnictwo Naukowe PWN, Warszawa s. 794

ADDITIONAL LITERATURE

1) Gajkowska-Stefańska L., Guberski S., Gutowski W., Mamak Z., Szperliński Z. 2007. Laboratoryjne badania wody, ścieków i osadów ściekowych, wyd. Oficyna wydawnicza PWN, Warszawa, s. 198

THE TEACHER/TEACHERS CONDUCTING THE CLASSES:

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