

56S1-PIKZS

INDUSTRIAL AND MUNICIPAL POLLUTION OF THE
ENVIRONMENT

ECTS: 3.5

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

FIELD OF THE STUDY: Environmental protection

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

Course status: **obligatory** *

Year of the study: II

COURSE CONTENTS

LECTURES: Formation, dissemination and transformation of chemical by-products in industry and human habitation. Definitions of environmental pollutants from industries that are major producers of pollutants. Characteristics of threats to the biosphere resulting from the development of energy, mining and road transport. Strategies to minimize or avoid risks. The city as a producer of municipal waste and sewage sludge. Municipal waste and sewage sludge management. Characteristics of pollution caused by individual electricity production technologies. The role of RES in maintaining the state of the environment.

CLASSES: Chemical and environmental characteristics of industrial and municipal waste products. Classes of persistent organic pollutants (PCDDs, PCDFs, PCBs, PAHs), hazards resulting from the energy sector based on the combustion of fossil fuels and the use of fissile materials. Population health risks and environmental losses from maintaining unsustainable transport systems. Environmental hazards resulting from the unconscious and widespread emission of compounds with hormonal activity. Familiarization with various environmental protection strategies in terms of combating pollution. Preventive strategies, principles of clean production. Industrial disasters and their environmental and social effects.

EDUCATIONAL PURPOSE: Acquire and organize information on the chemical aspects of the impact of technical civilization on the human living environment and the ecological systems of the planet. After completing the course, the student is to understand better the degree of threat resulting from the use of unsustainable production and transport systems, the limitations resulting from making efforts in the field of existing environmental protection strategies.

LEARNING OUTCOMES

Knowledge. The student describes and interprets the types, causes, and effects of pollutant emissions from industrial and municipal sources. Knows the consequences of non-compliance with the law and Good Manufacturing Practice – GMP. Knows the legal provisions concerning the problems of environmental protection against pollution of industry.

Skills. Can identify the types and sources of municipal and industrial pollution, and determine the routes of migration of substances and chemical compounds in the environment. Has the ability to monitor and take action to prevent the release of pollutants into the environment. Can predict the effects of the presence of harmful substances in the environment. Verifies hypotheses and draws conclusions.

Social competences. Is aware of the importance of environmental protection issues in municipal and industrial activity. Is responsible for making decisions regarding the implementation and compliance with the law, and he can inspire others to work and work in a team.

TEACHING FORMS AND METHODS

Lectures. Academic lecture with the use of multimedia.

Classes. Moderated discussions, presentations by students, and laboratory exercises.

FORM AND CONDITIONS FOR VERIFICATION OF LEARNING OUTCOMES

Lectures. Written exam, test questions on practice topics, getting more than half of the points.

Classes. Written exam, test questions on practice topics, getting more than half of the points.

BASIC LITERATURE

1) Alloway B.J., Ayres D.C., Chemiczne podstawy zanieczyszczenia środowiska. Wyd. Naukowe PWN, 1999. 2) Bilitewski B., Härdtle G., Marek K., Podręcznik gospodarki odpadami. Wyd. Seidel, Przywecki, 2003. 3) Falandysz J., Polichlorowane bifenylole (PCBs) w środowisku: chemia, analiza, toksyczność, stężenia i ocena ryzyka. Wyd. Fundacja Rozwoju UG, 1999. 4) Jezierski G., Energia jądrowa wczoraj i dziś. Wyd. WNT, 2005. 5) Kurnatowska A. (red.), Ekologia. Jej związki z różnymi dziedzinami wiedzy. Wyd. Naukowe PWN, 1999. 6) Manahan S., Toksykologia środowiska. Aspekty chemiczne i biochemiczne. Wyd. Naukowe PWN, 2006. 7) Sadowska A., Ekotoksykologia z elementami mutagenyzy i kancerogenyzy środowiskowej. Wyd. SGGW, 2010. 8) Wąsowski J., Bogdanowicz A., Mikroplastiki w środowisku wodnym. Wyd. Naukowe PWN, 2020.

ADDITIONAL LITERATURE

1) Cichy J.M., Czystsza produkcja i jej model fenomenologiczny, Wyd. Wyższa Szkoła Informatyki i Zarządzania, 2001. 2) Chmielniak T., Chmielniak T., Energetyka wodorowa, Wyd. Naukowe PWN, 2020. 3) Kiełczewski D., Konsumpcja a perspektywy zrównoważonego rozwoju, Wyd. Uniwersytetu w Białymstoku, 2008. 4) Nowak Z. (red.), Zarządzanie środowiskiem, Wyd. Politechniki Śląskiej, 2001.

THE TEACHER/TEACHERS CONDUCTING THE CLASSES:

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