

56S1-BIOWZANSR

BIOINDICATORS OF ENVIRONMENT EVALUATION

ECTS: 3.0

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: optional *

Year of the study: III

COURSE CONTENTS

LECTURES: Environmental toxicology and its scope. Toxic substances in the natural environment. Factors affecting the toxicity of xenobiotics. Toxicological and ecotoxicological assessment of chemical plant protection products. Characteristics of methods used in the assessment of environmental pollution. Biomonitoring of environmental pollution (types of biomonitoring, bioindication and bioindicators). Ways of conducting research with the use of bioindicators. Selection of a bioindicator. Toxicological biotests in the assessment of the state of the environment. Biological fluids as a source of information about human exposure to environmental chemical agents. Food as a bioindicator of polluted environment. Legal regulations concerning biotests.

CLASSES: Regulations and health and safety regulations applicable to students participating in classes. Environmental toxicology - basic concepts. Plants as bioindicators of environmental pollution. Determination of morphological and physiological changes in higher plants resulting from contamination of the soil environment. Effect of soil contamination on chlorophyll content in selected plants. Determination of the degree of water contamination with selected substances based on changes in optical density and oxygen production by algae. Determination of chlorinated hydrocarbons in rapeseed oil. Detection of nitrates and nitrites in water and food. Demonstration of the presence of salicylates in body fluid.

EDUCATIONAL PURPOSE: Familiarize the students with harmful substances in the environment and bioindicators used in the assessment of the natural environment polluted with various compounds.

LEARNING OUTCOMES

Knowledge. Has general knowledge of pollution, their fate in the environment and the impact on living organisms and their consequences. Is able to select a bioindicator for quick detection of pollutants in various elements of the environment. Distinguishes ways and criteria for determining chemical safety levels. He has general knowledge of legal regulations regarding environmental protection in Poland and in the world.

Skills. Has the ability to select and use chemical and biological methods and correctly interpret the results. Has the ability to identify, detect and assess the risk resulting from the presence of toxic compounds in the environment and make decisions. It independently determines the effective concentration of selected toxic compounds against various bioindicators.

Social competences. He can work in a group. He is aware of the responsibility for the environment in connection with human activity. He is aware of the need for training and self-improvement.

TEACHING FORMS AND METHODS

Lectures. Informative lecture with multimedia presentation

Classes. Laboratory exercises.

FORM AND CONDITIONS FOR VERIFICATION OF LEARNING OUTCOMES

Lectures. Written test - written test with open questions.

Classes. Written test with open questions, reports from laboratory exercises, Test of knowledge necessary to participate in exercises.

BASIC LITERATURE

1) Sikorski Ł., Adomas B., Biotesty w badaniach toksykologicznych i ekotoksykologicznych, Tom 4, Wyd. PAN, 2010. 2) Seńczuk W., Toksykologia współczesna, Wyd. PZWL Warszawa, 2005. 3) Traczewska T.M., Biologiczne metody oceny skażenia środowiska, Wyd. PW Wrocław, 2011. 4) Adomas B., Murawa D., Ćwiczenia z toksykologii środowiska, Wyd. UWM Olsztyn, 2006. 5) Manahan S. E., Toksykologia środowiska. Aspekty chemiczne i biochemiczne, Wyd. PWN Warszawa, 2006. 6) Laskowski R., Migula P., Ekotoksykologia, Wyd. PWRiL Warszawa, 2004.

ADDITIONAL LITERATURE

1) Sadowska A., Ekotoksykologia z elementami mutagenyzy i kancerogenyzy, Wyd. SGGW Warszawa, 2010.

THE TEACHER/TEACHERS CONDUCTING THE CLASSES:

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