



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Environmental toxicology [S1TCh2E>TŚ]

Course

Field of study

Chemical Technology

Year/Semester

2/4

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

English

Form of study

full-time

Requirements

elective

Number of hours

Lecture

30

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

The student starting this subject should have basic knowledge of chemistry (mainly in the area of properties and structure of chemical compounds) and biology, acquired during the earlier stage of education.

Course objective

The aim of the course is to acquaint the student with the basic principles of assessing the danger and risk of using various types of chemical compounds, quantifying the toxicity of chemical substances using various techniques and research methods, learning the mechanisms of toxicity, metabolism of toxic substances in living organisms and acquiring knowledge about the toxicology of selected groups of chemicals and diagnosis of poisoning as well as familiarization with selected issues and problems directly related to environmental toxicology.

Course-related learning outcomes

Knowledge:

1) possessing knowledge in the field of techniques and methods used for characterization and identification of toxic substances, typical environmental pollutants (K_W09); (2) possessing knowledge needed for understanding the social and aside from-technical conditioning of engineering activity

(K_W14); (3) possessing knowledge about the health risks resulting from utilization of chemicals in various fields of industry (K_W16)

Skills:

(1) gaining, integrating, reaching the conclusion and providing opinions based on information from the literature, scientific bases and other sources associated to chemical sciences (K_U01)

Social competences:

(1) understanding the need of improving the skills and raising the professional and personal competences (K_K01)

(2) possessing the consciousness of importance and understanding the aside from technical aspects and results of engineering activity including its influence of environment and connected with this responsibility for making decisions (K_K02)

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written pass (90 min.) with open and closed questions (approx. 2 open questions and approx. 50 test questions). Passing threshold: 50% of the maximum number of points. The issues constituting the basis for passing the course will be made available in the university's eLearning system.

Any alternative assessment method (which may also include other activities) will be agreed upon during the first class with the students.

Programme content

Issue related to environmental toxicology.

Course topics

I General toxicology

1. Toxicology - historical, scope and directions of development.
2. Poisons, poisonings and their causes - definition of poisons, doses, types of poisoning, causes and structure of poisoning.
3. Toxicity testing of chemical compounds - classification of toxicity, mutagenic, teratogenic, carcinogenic, effects on reproduction and offspring.
4. Biological and physicochemical factors influencing the toxicity of xenobiotics.
3. Adsorption, distribution, biotransformation and excretion of toxins. Mechanisms of toxic action.
6. Toxicometry and toxicokinetics.

II Detailed toxicology

1. Toxic activity of selected metals and non-metals and their compounds.
2. Toxicity of solvents, pesticides and plastics.
3. Toxicity of addictive substances.

III Applied toxicology - environmental toxicology

1. Contamination of the natural environment.
2. Chemical pollution of the air.
3. Chemical pollution of water.
4. Chemical contamination of the soil.
5. Natural origin poisons.
6. Chemicals versus living organisms.
7. Toxic substances in trophic chains.
8. Effects of toxic substances on assemblages of organisms.
9. Influence of toxic substances on processes occurring in ecosystems.
10. Health risk estimation.

Teaching methods

Classical lecture accompanied by the multimedia presentation.

Bibliography

Basic:

1. Hodgson E., A textbook of modern toxicology, Wiley, 2010, 4th Edition
2. Stine Karen E. Brown Thomas M., Principles of Toxicology, Paperbackshop Uk Import, 2000, 3rd Edition
3. James Robert C., Principles of Toxicology: Environmental and Industrial Applications, Wiley, 2022

Additional:

1. Hodgson, E., and R. C. Smart, eds. Introduction to Biochemical Toxicology, 3rd ed. New York: Wiley, 2001.
2. Hodgson, E., R. B. Mailman, and J. E. Chambers, eds. Dictionary of Toxicology, 2nd ed. London: Macmillan, 1998.
3. Klaassen, C. D. ed. Casarett and Doull's Toxicology: The Basic Science of Poisons, 6th ed. New York: McGraw-Hill, 2001.
4. Timbrell, J. A. Principles of Biochemical Toxicology, 3rd ed. London: Taylor and Francis, 2000.
5. Wexler, P. Information Resources in Toxicology, 3rd ed. San Diego: Academic Press, 2000.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	1,00