COURSE DESCRIPTION CARD - SYLLABUS

Course name
Industrial toxicology [S1TCh2>TP]

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
Polish

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 poisoningas as well as familiarization with selected issues and problems directly related to industrial 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 conslusion 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 conciousness of importance and understanding the aside fromtechnical aspects and results of engineering activity including its influence of environment and connected with this responsibility for maked 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.

Programme content

Issues in industrial 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
5. 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 - industrial toxicology
1. Toxicity assessment of industrial substances.
2. Assessment of exposure to airborne substances.
3. Assessment of exposure to carcinogens.
4. Assessment of exposure to mixtures of substances.
5. Air analysis methodology.
6. Exposure, effect and sensitivity biomarkers.
7. Occupational diseases.
8. Legal aspects.
9. Health risk estimation.
10. First aid in emergency poisoning.

Teaching methods

Classical lectrure accompanied by the multimedia presentation.

Bibliography

Basic:
1. W. Seńczuk (red.), Toksykologia Współczesna, PZWL, Warszawa 2019.
2. W. Seńczuk (red.), Toksykologia. Podręcznik dla studentów, lekarzy i farmaceutów, PZWL Warszawa

1999.

Additional:
1. J. K. Piotrowski (red.), Podstawy toksykologii; kompendium dla studentów szkół wyższych, WNT, Warszawa 2006.
2. E. Bezak-Mazur, Elementy toksykologii środowiskowej, Wydawnictwo Politechniki Śląskiej, Kielce 2001.
3. M. Biziuk (red.), Pestycydy; występowanie, oznaczanie i unieszkodliwianie, WNT, Warszawa 2001.
4. K. Jurowski, W. Piekoszewski (red.), Toksykologia I, PZWL, Warszawa 2020.
5. K. Jurowski, W. Piekoszewski (red.), Toksykologia II, PZWL, Warszawa 2020.

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