

Course title: TOXICOLOGY

ECTS credit allocation (and other scores): 3

Semester: autumn

Level of study: ISCED-7 - second-cycle programmes (EQF-7)

Branch of science: Natural sciences

Language: English

Number of hours per semester: 45 h.

Course coordinator: Sylwia Świgońska; Department of Biochemistry; sylvia.swigonska@uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES: The student conducts experiments, analyzes and draws conclusions from the obtained results. During classes, the student will perform the isolation and analysis of alkaloids from the *Nicotiana* genus as well as other toxicological analyses, i.e., potentiometric determination of phosphoric acid in carbonated beverages; analysis of toxic rancidity products in fats; spectrophotometric determination of methyl salicylate in pharmaceutical preparations; analysis of sulfur dioxide content in wine and anti-nutritional components found in food products/fruits/vegetables

LECTURES: Chemical, biological, and genetic factors determining toxicity of various substances. Fate of poisons in the body — absorption, distribution, excretion, and biotransformation. Toxicology of addictive substances and so-called "designer drugs". Alcohol toxicity and alcoholism. Toxicology of pesticides and synthetic materials. Natural toxic substances in food, contaminants introduced during food production, processing, and storage. Plant- and animal-derived toxins. Harmful substances in cosmetics. Environmental contamination and methods for environmental protection.

LEARNING PURPOSE: Familiarization with concepts and definitions used in toxicology. Deepening the knowledge gained during previously completed courses. Developing the ability to apply the acquired knowledge in both practical and theoretical activities. Understanding the necessity of responsible labwork, in accordance with safety guidelines. Developing skills in using various analytical methods in toxicological studies, interpreting results, and utilizing professional literature.

On completion of the study program, the student will gain the following competencies:

KNOWLEDGE: Student defines the concept of xenobiotic and poison explaining their mechanisms of action at the cellular level. Has knowledge of the pathways for poison absorption, their metabolism, distribution, accumulation, and excretion. Understands the necessity of health protection and environmental conservation in the context of toxicological risks.

SKILLS: student can proficiently use terminology employed in toxicology. Applies acquired knowledge to conduct basic analyses of toxins and assess their effects on the body. Demonstrates teamwork skills.

SOCIAL COMPETENCIES: Student exhibits a responsible attitude toward society. Recognizes the importance of scientifically verifying common judgments. Understands the need for preserving the human living environment.

Basic literature:

1. Jerzy Piotrowski, Podstawy toksykologii, Wyd. WN-T Warszawa, R. 2017
2. Janusz Hanke, Biochemiczne podstawy toksykologii, Wyd. PZWŁ, R. 1984

Supplementary literature

1. Mutschler Ernst, Farmakologia z elementami toksykologii, Wyd. MedPharm Polska, R. 2020
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The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 49 h.

Student's independent work: 26 h.