



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Fundamentals of toxicology [S1IFar2>PT]

Course

Field of study

Pharmaceutical Engineering

Year/Semester

3/6

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

0

Number of credit points

2,00

Coordinators

prof. dr hab. Marek Murias

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Lecturers

Prerequisites

The student starting this subject should have a basic knowledge of anatomy as well as human physiology and pathophysiology. The student should also possess knowledge about the biochemistry of processes related to the absorption, metabolism and elimination of xenobiotics. They should have a basic understanding of the processes taking place in cells at the molecular level. They should have knowledge about the structure of DNA and proteins. The basic knowledge about enzymes: regulation of their expression and well kinetics will be also necessary. They be able to classify chemical compounds (both organic and inorganic) due to their reactivity and molecular structure (e.g. non-polar polar compounds). They should also have basic knowledge of physical chemistry and such processes like evaporation, diffusion or interactions between molecules having an electric charge.

Course objective

Providing students with basic knowledge about the mechanisms of toxic action, interactions of xenobiotics, absorption routes, metabolism and elimination of xenobiotics, and the factors that modulate them. Basic information on the diagnosis and treatment of the most common poisonings and the most commonly used antidotes will be presented. The graduate should be able to secure the workplace in terms of toxicological safety and be able to interpret the information contained in the safety data sheets of chemical substances. He should know that the pharmaceutical industry can have a destructive impact on the natural environment and the people living in it, and he should know how to actively participate in the processes of reducing it.

Course-related learning outcomes

Knowledge:

1. The Absolvent knows the mechanisms of action of poisons, knows the basic mechanisms that modulate the course of poisoning, knows the most important toxic compounds used in the pharmaceutical industry, has knowledge of how to avoid poisoning and and knows basic antidotes. [KW_1, KW_5, KW_8 KW_22, KW_23]

Skills:

1. The Absolvent is able to secure the workplace in terms of toxicological safety, The Absolvent is able to interpret the information contained in the material safety data sheets. [K_U3, K_U10, KU_12, K_U22]

Social competences:

1. Knows that the pharmaceutical industry can have a destructive impact on the environment and the people and animals inhabiting it, can actively participate in its reduction processes. [K_K1, K_K2, K_K3, K_K4]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

One test exam containing 60 questions and lasting 60 minutes, the threshold of passing 31 correct answers (stationary or remote form depending on the epidemiological situation).

Programme content

The program includes the following topics:

1. Introduction to toxicology.
2. Main aspects of toxicokinetics.
3. Chemical carcinogenesis.
4. Selected aspects of organ toxicology.
5. Selected toxic substances.
6. Ecotoxicology and nanotoxicology.
7. Food toxicology.
8. Toxicology in the work environment.
9. Legal regulations of toxicology.

Course topics

1. General Principles of Toxicology, history and scope of toxicology, principles of toxicology, mechanisms of Toxicity
2. Disposition of toxicants, Absorption, Distribution, and Excretion of Toxicants, Biotransformation of Xenobiotics
3. Non-organ-directed toxicity, chemical carcinogenesis, genetic toxicology, developmental toxicology
4. Target Organ Toxicity selected problems caused by xenobiotics in liver, kidney, central nervous system, endocrine system
5. Toxic Agents, Toxic Effects of Solvents and Vapours, Toxic Effects of Radiation and Radioactive Materials, Toxic Effects of Plants and Animals, Toxic Effects of Calories
6. Environmental Toxicology Nanotoxicology and Air Pollution
7. Applications of Toxicology, Ecotoxicology, Food Toxicology, Occupational Toxicology, Regulatory Toxicology

Teaching methods

Lectures supported by multimedia

Bibliography

Basic:

1. Casarett & Doull "Podstawy toksykologii" - Curtis D. Klaassen, John B. Watkins III, red. wyd. pol Barbara Zielińska-Psuja, red. wyd. pol. Andrzej Sapota

Additional:

1. Jerzy K. Piotrowski Podstawy toksykologii. Kompendium dla studentów szkół wyższych PWN 2017

Breakdown of average student's workload

| | Hours | ECTS |
|---|-------|------|
| Total workload | 55 | 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) | 25 | 1,00 |