



Subject card

|   |   |  |  |                                     |         |  |     |
|---|---|--|--|-------------------------------------|---------|--|-----|
| Subject name and code                       | Toxicology, PG_00053380   |  |  |                                     |         |  |     |
| Field of study                              | Biomedical Engineering, Biomedical Engineering, Biomedical Engineering  |  |  |                                     |         |  |     |
| Date of commencement of studies             | February 2025   | Academic year of realisation of subject                  |  |                                     |         | 2025/2026  |     |
| Education level                             | second-cycle studies  | Subject group  |  |                                     |         | Optional subject group<br>Specialty subject group<br>Subject group related to scientific research in the field of study  |     |
| Mode of study                               | Full-time studies   | Mode of delivery   |  |                                     |         | at the university  |     |
| Year of study                               | 1   | Language of instruction                                  |  |                                     |         | Polish   |     |
| Semester of study                           | 2   | ECTS credits   |  |                                     |         | 2.0  |     |
| Learning profile                            | general academic profile  | Assessment form  |  |                                     |         | assessment   |     |
| Conducting unit                             | Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry  |  |  |                                     |         |  |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor  |  | dr inż. Monika Pawłowska   |                                     |         |  |     |
|   | Teachers  |  |  |                                     |         |  |     |
| Lesson types and methods of instruction     | Lesson type   | Lecture  | Tutorial   | Laboratory                          | Project | Seminar  | SUM |
|   | Number of study hours   | 15.0   | 0.0  | 0.0                                 | 0.0     | 15.0   | 30  |
|   | E-learning hours included: 0.0  |  |  |                                     |         |  |     |
| Learning activity and number of study hours | Learning activity   | Participation in didactic classes included in study plan |  | Participation in consultation hours |         | Self-study   | SUM |
|   | Number of study hours   | 30   |  | 2.0                                 |         | 18.0   | 50  |
| Subject objectives                          | Transfer of knowledge about the toxic properties of compounds and their impact on living organisms and the environment, Presentation of methods for their detection and possible countermeasures.   |  |  |                                     |         |  |     |
| Learning outcomes                           | Course outcome  |  | Subject outcome  |                                     |         | Method of verification   |     |
|   | [K7_W03] knows and understands, to an increased extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum |  | Has an in-depth knowledge of the mechanisms of action of toxic compounds, understands the relationship between their action and the reaction of a living organism; is able to present in detail the impact of materials used in engineering on human health. |                                     |         | [SW2] Assessment of knowledge contained in presentation  |     |
|   | [K7_K02] is ready to provide critical evaluation of received content and to acknowledge the importance of knowledge in solving cognitive and practical problems   |  | Can apply the knowledge acquired so far to assess the toxicity of agents external, possibilities of implementing this knowledge to describe chemical phenomena and processes observed in the environment man and industry.                                   |                                     |         | [SK3] Assessment of ability to organize work<br>[SK4] Assessment of communication skills, including language correctness<br>[SK5] Assessment of ability to solve problems that arise in practice |     |
|   | [K7_W51] Knows and understands, to an increased extent, selected aspects of chemistry and biochemistry constituting general knowledge in the field of biomedical engineering.   |  | Can use his knowledge to describe the threats resulting from the influence of external factors on humans and other organisms in the environment. Can apply his knowledge in biomedical engineering, designing safer technical solutions.                     |                                     |         | [SW3] Assessment of knowledge contained in written work and projects<br>[SW2] Assessment of knowledge contained in presentation<br>[SW1] Assessment of factual knowledge                         |     |

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| Subject contents   | <p>The following topics will be discussed during the classes:</p> <ol style="list-style-type: none"> <li>1. Basic definitions in the field of toxicology, history of toxicology.</li> <li>2. Physicochemical properties affecting the toxicity of compounds.</li> <li>3. The fate of substances in the body, routes and mechanisms of entry, metabolic reactions as a route of activation and detoxification, excretion of substances and their accumulation. Problems of bioconcentration and bioaccumulation in the body and the environment.</li> <li>4. Methods of testing the toxicity of substances towards living organisms and the environment as a whole.</li> <li>5. Selected physiological effects of toxic substances: effect on the nervous system, carcinogenic effects, teratogenic, immunosuppressive and allergic environmental pollutants.</li> <li>6. Mechanisms of toxic action of selected groups of compounds, including: heavy metals, asbestos, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, bisphenols, dioxins and xenoestrogens.</li> </ol> |  |                               |
| Prerequisites and co-requisites                                |  |  |                               |
| Assessment methods and criteria                                | Subject passing criteria   | Passing threshold  | Percentage of the final grade |
|  | Seminar - evaluation of a presentation lasting approximately 20 minutes on a selected topic in the field of toxicology   | 60.0%  | 40.0%                         |
|  | Lecture - final test of about 10 questions, lasting 60 minutes   | 60.0%  | 60.0%                         |
| Recommended reading  | Basic literature   | <ol style="list-style-type: none"> <li>1. Witold Seńczuk, Toksykologia Współczesna, PZWL, Warszawa, 2006</li> <li>2. Sigmund F. Zakrzewski, Podstawy toksykologii środowiska, PWN 1997</li> <li>3. Jerzy K. Piotrowski, Podstawy toksykologii, PWN, 2005</li> </ol>                      |                               |
|  | Supplementary literature   | <ol style="list-style-type: none"> <li>1. J. Lewin-Kowalik, Fizjologia człowieka. Podręcznik dla studentów kierunków medycznych, Edra Urban &amp; Partner, 2024</li> <li>2. C.H. Walker, S.P. Hopkin, R.M. Silby, D.B. Peakali, Podstawy Ekotoksykologii, PWN, Warszawa, 2002</li> </ol> |                               |
|  | eResources addresses   | Adresy na platformie eNauczanie:   |                               |
| Example issues/<br>example questions/<br>tasks being completed | <p>What are the characteristics of the substances that make them toxic?<br/>         What are the stages of metabolic transformations of xenobiotics getting into living organisms?<br/>         How to determine the LD50 dose?<br/>         Why are xenoestrogens dangerous contaminants?</p>  |  |                               |
| Work placement   | Not applicable   |  |                               |

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