

## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                          |                                         |                                     |                        |            |     |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|------------------------|------------|-----|
| Subject name and code                       | Fundamentals of pharmacokinetics for chemists, PG_00179587                                                                                                                                                                                                                                                                                                                                                                    |                                                          |                                         |                                     |                        |            |     |
| Field of study                              | Chemistry                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                          |                                         |                                     |                        |            |     |
| Date of commencement of studies             | October 2025                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                          | Academic year of realisation of subject |                                     | 2026/2027              |            |     |
| Education level                             | Master's studies                                                                                                                                                                                                                                                                                                                                                                                                              |                                                          | Subject group                           |                                     | Optional subject group |            |     |
| Mode of study                               | full-time studies                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          | Mode of delivery                        |                                     | at the university      |            |     |
| Year of study                               | 2                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          | Language of instruction                 |                                     | Polish                 |            |     |
| Semester of study                           | 4                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          | ECTS credits                            |                                     | 2.0                    |            |     |
| Learning profile                            | academic                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                          | Assessment form                         |                                     | credit                 |            |     |
| Conducting unit                             | Faculty of Chemistry -> Rector                                                                                                                                                                                                                                                                                                                                                                                                |                                                          |                                         |                                     |                        |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                                                                                                                            |                                                          | dr hab. Aleksandra Dąbrowska            |                                     |                        |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                          |                                         |                                     |                        |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                                                                                                                                                                                                                   | Lecture                                                  | Tutorial                                | Laboratory                          | Project                | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                                                                                         | 30.0                                                     | 0.0                                     | 0.0                                 | 0.0                    | 0.0        | 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                                                       |                                         | 5.0                                 |                        | 15.0       | 50  |
| Subject objectives                          | The aim of the course is to introduce students to the fundamental concepts and mechanisms of pharmacokinetics, with a particular focus on the relationship between the chemical properties of compounds and their behavior in the body. The course aims to develop students skills in analyzing pharmacokinetic data and applying modern measurement techniques and theoretical models to describe pharmacokinetic processes. |                                                          |                                         |                                     |                        |            |     |

| Learning outcomes               | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                    | Subject outcome                                                                                                                                                                                                       | Method of verification                                                      |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
|                                 | [CHEMMU2_W07] Selects experimental and theoretical techniques to the extent necessary to understand the description and modelling of medium complexity chemical processes.                                                                                                                                                                                                                                        | The student identifies and selects basic theoretical models and analytical techniques used to describe and analyse pharmacokinetic processes of medium complexity.                                                    | [SW4] test/exam - oral or written<br>[SW5] implementation of a problem task |
|                                 | [CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.                                                                                                                                                                                                                                                                   | The student recognizes the limits of their pharmacokinetic knowledge and identifies the need for further learning; actively participates in discussions and encourages others to seek knowledge.                      | [SK4] test/exam - oral or written<br>[SK5] implementation of a problem task |
|                                 | [CHEMMU2_W05] Has extended knowledge in the field of the specialisation studied.                                                                                                                                                                                                                                                                                                                                  | The student demonstrates advanced knowledge in pharmacokinetics, particularly regarding the influence of chemical properties on the fate of compounds in the body.                                                    | [SW4] test/exam - oral or written<br>[SW5] implementation of a problem task |
|                                 | [CHEMMU2_U03] Finds necessary information in specialist literature, databases and other sources, lists basic scientific journals in chemistry.                                                                                                                                                                                                                                                                    | The student independently searches for information on pharmacokinetic processes in scientific literature and databases, and identifies key journals in chemistry and pharmacology.                                    | [SU4] test/exam - oral or written<br>[SU5] implementation of a problem task |
|                                 | [CHEMMU2_U02] Critically assesses the results of conducted, performed observations and theoretical calculations and discusses errors.                                                                                                                                                                                                                                                                             | The student critically interprets pharmacokinetic data, identifies possible sources of error in parameter calculations, and draws conclusions regarding the reliability of results.                                   | [SU4] test/exam - oral or written<br>[SU5] implementation of a problem task |
|                                 | [CHEMMU2_W03] Demonstrates extended knowledge in the field of modern measuring techniques used in chemical analysis.                                                                                                                                                                                                                                                                                              | The student demonstrates advanced knowledge of modern measurement techniques used in pharmacokinetics and chemical analysis of active substances.                                                                     | [SW4] test/exam - oral or written<br>[SW5] implementation of a problem task |
|                                 | [CHEMMU2_U04] Applies acquired knowledge of chemistry and related scientific disciplines.                                                                                                                                                                                                                                                                                                                         | The student applies knowledge of chemistry and related disciplines (biology, physiology) to describe and analyse pharmacokinetic processes: absorption, distribution, metabolism, and excretion of active substances. | [SU4] test/exam - oral or written<br>[SU5] implementation of a problem task |
|                                 | [CHEMMU2_K05] Understands the need for independent search of information in scientific literature and popular science magazines.                                                                                                                                                                                                                                                                                  | The student independently searches for and analyses information from scientific and popular science literature related to pharmacokinetics.                                                                           | [SK4] test/exam - oral or written<br>[SK5] implementation of a problem task |
|                                 | [CHEMMU2_W04] Applies the acquired knowledge to an in-depth description of the properties of chemical connections, methods of their synthesis and analysis.                                                                                                                                                                                                                                                       | The student applies chemical knowledge to an in-depth description of the relationship between chemical structure and pharmacokinetic properties (absorption, metabolism, elimination).                                | [SW4] test/exam - oral or written<br>[SW5] implementation of a problem task |
| Subject contents                | Introduction to Pharmacokinetics. Chemical Properties and Pharmacokinetics. Pharmacokinetic Models. Measurement Methods in Pharmacokinetics. Pharmacokinetic Data Analysis. Application of Pharmacokinetics in Drug Design.                                                                                                                                                                                       |                                                                                                                                                                                                                       |                                                                             |
| Prerequisites and co-requisites | <p><b>Additional Requirements:</b> Basic knowledge of general and organic chemistry; Fundamental understanding of chemical analytics; Ability to use scientific literature and databases.</p> <p><b>Additional Desirable Skills:</b> Basic knowledge of biology and biochemistry is an advantage; Ability to work independently and think analytically; Interest in pharmacokinetics and pharmacology topics.</p> |                                                                                                                                                                                                                       |                                                                             |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                          | Passing threshold                                                                                                                                                                                                     | Percentage of the final grade                                               |
|                                 | exam                                                                                                                                                                                                                                                                                                                                                                                                              | 51.0%                                                                                                                                                                                                                 | 50.0%                                                                       |
|                                 | test 2                                                                                                                                                                                                                                                                                                                                                                                                            | 51.0%                                                                                                                                                                                                                 | 25.0%                                                                       |
|                                 | test 1                                                                                                                                                                                                                                                                                                                                                                                                            | 51.0%                                                                                                                                                                                                                 | 25.0%                                                                       |

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| Recommended reading                                            | Basic literature         | 1. E. Wyska: Farmakokinetika Podstawy i znaczenie praktyczne,<br><br>2. T. W. Herman: Farmakokinetika |
|                                                                | Supplementary literature | publications and scientific studies                                                                   |
|                                                                | eResources addresses     |                                                                                                       |
| Example issues/<br>example questions/<br>tasks being completed |                          |                                                                                                       |
| Work placement                                                 | Not applicable           |                                                                                                       |

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