



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Pharmaceutical Chemistry and Analysis

### Course

Field of study

Pharmaceutical Engineering

Area of study (specialization)

-

Level of study

Form of study

Year/Semester

3/5

Profile of study

Course offered in  
polish

Requirements

### Number of hours

Lecture

25

Laboratory classes

35

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

4

### Lecturers

Responsible for the course/lecturer:

Prof. Beata Stanisiz, MSc, PhD; Prof. Anna  
Jelińska, MSc, PhD; Magdalena Ogrodowczyk,  
MSc, PhD

Responsible for the course/lecturer:

Prof. Beata Stanisiz, MSc, PhD

### Prerequisites

Knowledge in the field of biochemistry, analytical chemistry and physical chemistry

### Course objective

Acquaintance with chemical structure of pharmaceutical compounds, their chemical properties and determination methods. Development of skills needed to perform both qualitative and quantitative chemical analysis. Acquaintance with analysis used in the quality assessment of raw materials used in pharmaceutical and cosmetic industry.

### Course-related learning outcomes

Knowledge



K\_W1; has general knowledge in the field of pharmacy, cosmetology, technology and chemical engineering as disciplines directly related to pharmaceutical engineering; P6S\_WG P6SI\_WG

K\_W11; knows the basics of kinetics, thermodynamics and catalysis of chemical processes; P6S\_WG

K\_W25; has detailed knowledge about pharmaceutical and cosmetic compounds, dietary supplements, plant raw materials and their fabrication; P6S\_WG P6S\_WK

#### Skills

K\_U11; can select and apply analytical methods and techniques for qualitative and quantitative analysis, process control, as well as for the quality control of raw materials and products; P6S\_UW P6SI\_UW

#### Social competences

K\_K1; is able to critically assess her/his knowledge; understands the necessity of continuous education, gaining new knowledge and professional, personal and social qualifications; understands the significance of knowledge in problem solving and is able to ask for experts' opinions; P6S\_KK

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge gained during lectures is verified in a form of an oral exam.

Knowledge gained during classes is verified:

- in a form of two control tests (classes 2. and 6.) Every test is composed of three 'open' questions (passing threshold: 60% of points) and
- in a form of a practical exam carried out using OSCE method (class 7.)

#### Programme content

##### Lectures

Overview of: questions concerning basic mechanisms of action of drugs on the molecular level; the chemical structure and reactivity of selected groups of drugs, the relationship between the chemical structure and action; pharmacopeial and non-pharmacopeial methods of quality assessment; the contamination analysis in the assessment of the quality and security of use of a product; validation parameters for different analytical methods; the problem of durability of the raw material and the final product; the use of spectroscopic methods in the identification of a compound; choice criteria for methods used in quantitative analysis.

##### Classes

Classes comprise analytical topics related to the quality assessment of pharmaceutical and cosmetic compounds and products, in the view of current pharmacopeial and non-pharmacopeial norms, ICH guidelines concerning the quality and the durability of drugs, as well as the issue of counterfeit medications.



Practical classes are preceded by the introduction to current edition of the Polish Pharmacopeia, particularly with methods used for the identification of drugs, as well as their quality and purity assessment.

The student will get to know the classical and instrumental methods used for the identification, quantitative analysis and the purity control of the raw material and the pharmaceutical or cosmetic product in the view of physicochemical properties of the compounds, such as: solubility, melting point of the substance and its derivatives, optical rotation, refractive index, chemical reactions specific for the group of compounds and specific substances. The student will perform individual analyses from the scope of topics of laboratory classes. A practical exam will be held at the end of the laboratory course.

### Teaching methods

Interactive lectures with multimedia presentations, individual laboratory classes, presentation of study results and preparation of a report of performed studies.

### Bibliography

#### Basic

1. Zając M, Pawełczyk E, Jelińska A. Chemia Leków. Wydawnictwo Naukowe Akademii Medycznej im. Karola Marcinkowskiego w Poznaniu, 2006.
2. Farmakopea Polska IX, 2011.
3. Ocena jakości substancji i produktów leczniczych – podręcznik dla studentów farmacji pod red. M. Zając i A. Jelińskiej, Wydawnictwo Naukowe Uniwersytetu Medycznego im. Karola Marcinkowskiego w Poznaniu, 2010

#### Additional

1. Steinhilber D., Schubert-Zsilavec M., Roth H.J. Chemia medyczna, redakcja wydania polskiego Jelińska A., Pałka J. Zając M., MedPharm Polska, Wrocław, 2012.
2. Marzec A.: Chemia kosmetyków, Surowce, półprodukty, preparatyka wyrobów. Dom Organizatora TNOiK, 2009.
3. Stanisław B., Muszalska I.: Metody badania jakości surowców i produktów kosmetycznych. Uniwersytet Medyczny im. Karola Marcinkowskiego, Poznań 2009.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4
Classes requiring direct contact with the teacher	70	2,8
Student's own work (literature studies, preparation for laboratory classes, preparation for tests/exam) <sup>1</sup>	30	1,2

<sup>1</sup> delete or add other activities as appropriate