



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Chemistry of drugs - use of chromatographic and spectrophotometric methods in pharmaceutical analysis  
[S1IFar2>CLwmcswanf]

### Course

Field of study

Pharmaceutical Engineering

Year/Semester

3/5

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

elective

### Number of hours

Lecture

0

Laboratory classes

0

Other

0

Tutorials

15

Projects/seminars

0

### Number of credit points

1,00

### Coordinators

dr Maria Popielarz-Brzezińska

dr hab. Magdalena Ogrodowczyk

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### Lecturers

### Prerequisites

A student starting this subject should have basic knowledge in chemistry and biology.

### Course objective

Classes are designed to familiarize the student with the problems of the selection of the analytical method in the qualitative and quantitative analysis of multi-component pharmaceutical preparations, cosmetics and dietary supplements. The student will become familiar with the possibilities, limitations and application of modern instrumental analysis techniques, using spectroscopic (UV-VIS, FT-IR, NMR, MS, ASA), chromatographic (GC, HPLC).

### Course-related learning outcomes

Knowledge:

1. Student has knowledge of basic techniques, methods for characterizing and identifying pharmaceutical products and research tools used in pharmaceutical engineering, knows instrumental

methods used in assessing the quality of substances for pharmaceutical purposes and in quantitative analysis in medicinal products, knows the physicochemical properties of substances for pharmaceutical use knows the classification of techniques analytical together with method selection criteria and method validation. [K\_W7]

2. Student knows the basic principles of occupational health and safety. [K\_W27]

Skills:

1. Student uses pharmacopoeial methods, prepares documentation, selects and applies analytical methods and techniques in qualitative and quantitative analysis as well as to control processes and assess the quality of raw materials and products. [K\_U11]

2. Student has the ability to self-study. [K\_U24]

Social competences:

1. Student is ready to critically assess their knowledge, understands the need for further education, supplementing their field knowledge and raising their professional, personal and social competences, understands the importance of knowledge in solving problems and is ready to seek expert opinions. [K\_K1]

2. Student is ready to show respect and care for good towards all the people he/she will work with. [K\_K4 ]

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Exercises in the form of active discussion. Preparation and discussion of presentations regarding the subject matter. Final test - 10 test questions (stationary or remote form depending on the epidemiological situation).

### Programme content

The program covers the following topics:

1. Theoretical foundations of selected analytical techniques used in drug analysis.

2. Selection of chemical analysis parameters.

3. Basics of quantitative and qualitative analysis.

### Course topics

The student will familiarize with the theoretical foundations of modern analytical techniques used in accordance with the recommendations of the latest pharmacopoeia and the manufacturer's standards. As part of this, the following issues will be discussed:

- Selection of conditions for qualitative and quantitative analysis of active substances, excipients and solvents of medicinal preparations carried out by means of gas chromatography.
- The use of various types of liquid chromatography (ion exchange, gel, partitioning and adsorption) for the analysis of active substances in pharmaceutical preparations.
- Qualitative and quantitative analysis of pharmaceutical preparations and their active ingredients by methods:
  - o UV-VIS spectrophotometry, infrared spectroscopy, Raman spectrometry, nuclear magnetic resonance spectrometry,
  - o paramagnetic electron resonance spectrometry, mass spectrometry, atomic absorption spectrometry, spectrofluorimetry

### Teaching methods

multimedia presentation

### Bibliography

Basic:

1. Szczepaniak W.: „Metody instrumentalne w analizie leków” PWN, Warszawa, 2009

2. Farmakopea Polska XI, PTFarm, Warszawa, 2019

Additional:

1. Jarosz M.: „Nowoczesne techniki analityczne”, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2006

2. Cygański A.: Metody spektroskopowe w chemii analitycznej, Wydawnictwo Naukowo-Techniczne, Warszawa, 1997

### Breakdown of average student's workload

	Hours	ECTS
Total workload	30	1,00
Classes requiring direct contact with the teacher	15	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	15	0,50