



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Plant raw materials [S1IFar1>SR]

### Course

Field of study

Pharmaceutical Engineering

Year/Semester

1/2

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

20

Laboratory classes

25

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

3,00

### Coordinators

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### Lecturers

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## Prerequisites

The student starting the course should have basic knowledge of botanical systematics, morphological and anatomical structure of plants, structure of organic and inorganic chemical compounds, physiology and biochemical processes occurring in the human body, and basic methods used in chemical compound analysis. The student should also be able to obtain information from specified sources and be willing to cooperate as part of a team.

## Course objective

Teaching about the chemical structure, physicochemical properties, as well as biological and pharmacological activity of groups of compounds present in plant raw materials, justifying their action on the human body. Acquiring knowledge about the chemical composition, operation and use of the most important plant materials as well as morphological and anatomical features enabling their identification. Understanding the basic analytical methods used in the determination and / or quality control of plant raw materials / preparations.

## Course-related learning outcomes

Knowledge:

k\_w1. has ordered general knowledge in the field of pharmacy, cosmetology as related fields directly related to pharmaceutical engineering

k\_w7. has knowledge of basic techniques, methods for characterizing and identifying pharmaceutical products and research tools used in pharmaceutical engineering, knows classical and 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 on the biological activity of drugs, knows the classification of analytical techniques together with the criteria for the selection of methods and method validation

k\_w25. has detailed knowledge of substances for pharmaceutical and cosmetic use, dietary supplements, plant raw materials, their production, analysis and quality control, technology, knows and understands the principles of marketing medicinal products, cosmetics and dietary supplements, knows the pharmacopoeial requirements in the field of substance quality assessment and medicinal products

Skills:

k\_u1. he understands literature in the field of pharmaceutical engineering in polish; reads and understands uncomplicated scientific and technical texts in a foreign language, is able to obtain information from literature, databases and other sources related to pharmaceutical engineering, also in a foreign language, integrate them, interpret them, draw conclusions and formulate opinions

k\_u8. uses basic techniques, research equipment and apparatus useful in biotechnology, synthesis and analysis of pharmaceutically active substances, drug form technology and toxicology, appropriate for pharmaceutical engineering, uses pharmacopoeial methods, prepares documentation

k\_u11. 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\_u24. has the ability to self-study

k\_u25. in a professional and research environment, he can plan and organize individual and team work as well as work both individually and as a team

Social competences:

k\_k1. he is ready to critically assess his knowledge, understands the need for further education, supplementing disciplinary knowledge and raising his professional, personal and social competences, understands the importance of knowledge in solving problems and is ready to seek expert opinions.

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Knowledge acquired during the lecture is verified during the final test. The test consists of 30 questions. Minimum number of points to pass: 60% of points.

Skills acquired as part of the laboratory classes are verified during active participation in classes and observation of student work during classes. Skills are verified on the basis of the final test, consisting of 30 questions on the topic of completed exercises. Minimum number of points to pass: 60% of points.

Depending on the epidemiological situation, after the end of the classes, the final test will be conducted in a stationary or remote form.

## Programme content

Lectures: The concept of vegetable raw material. Characteristics of types of plant raw materials. Registration of medicines based on plant raw materials. Rules for harvesting plant materials. Processes of transformation of plant raw materials to obtain specific pharmaceutical forms. Test methods for quality control of plant raw materials. Characteristics of the identity, occurrence and use of plant raw materials containing primary metabolites. Characteristics of the identity, occurrence and use of plant raw materials containing specialized metabolites (phenolic acids, flavonoids, lignans, flavonolignans, anthocyanins, sulfur compounds, cannabinoids, tannins and quinones, coumarins, cardiac glycosides, saponosides, terpenes, essential oils, alkaloids).

Exercises: Registration of plant materials. Pharmacopoeial monograph analysis. Anatomical and morphological analysis of plant raw materials. Acquiring knowledge about phytochemical methods of identity confirmation, standardization of selected raw materials / preparations and other specified tests, among others in the Polish Pharmacopoeia.

## Teaching methods

Multimedia introductory presentations for classes. Observations of morphological features in herbal mixtures and anatomical features in independently prepared microscopic preparations. Phytochemical analysis by classical and instrumental methods of selected raw materials / preparation.

## Bibliography

### Basic

Matławska I. red. Farmakognozja. Podręcznik dla studentów farmacji. WUAM, Poznań 2008.

Lamer-Zarawska E. red. Fitoterapia i leki roślinne. PZWL, Warszawa 2019.

Chwała C., Gwardys A., Lamer-Zarawska E. Rośliny w kosmetyce i kosmetologii przeciwstarzeniowej. PZWL, Warszawa 2018.

### Additional

Farmakopea Polska XI

## Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	45	1,80
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,20