



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Chemistry of Natural Compounds - Structure and Biological Significance of Selected Biomolecules

### Course

Field of study

Pharmaceutical Engineering

Area of study (specialization)

-

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

polish

Requirements

elective

### Number of hours

Lecture

0

Laboratory classes

0

Other (e.g. online)

0

Tutorials

15

Projects/seminars

0

### Number of credit points

1

### Lecturers

Responsible for the course/lecturer:

dr hab. n. farm. Barbara Bednarczyk-Cwynar

Responsible for the course/lecturer:

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### Prerequisites

Classes are intended for students who have basic knowledge of organic chemistry.

### Course objective

Broadening of knowledge on compounds of natural origin that have important biological significance.

Understanding the specific characteristics of chemical structure and understanding of genetic and structural interrelationships between individual classes of natural compounds and also within these classes.



Facilitation of further effective study of subjects related to the science of drug production.

### Course-related learning outcomes

#### Knowledge

K\_W1. Has ordered general knowledge in the field of pharmacy, cosmetology, technology and chemical engineering as related fields directly related to pharmaceutical engineering

K\_W7. Has knowledge of the basic techniques, methods for characterizing and identifying pharmaceutical products and research tools used in pharmaceutical engineering, knows the 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\_W13. has knowledge of natural and synthetic raw materials, products and processes used in the pharmaceutical industry

K\_W24. Has basic knowledge in the field of methods of searching for new medicinal substances, plant and synthetic medicine as well as their biochemical and molecular gripping points, pharmacopoeial standards and norms related to pharmaceutical engineering; knows the methods and techniques of researching medicinal products in chemical, pharmaceutical and toxicological terms

#### Skills

K\_U1. 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 and draw conclusions and formulate opinions

K\_U3. Uses correct chemical and pharmaceutical terminology and nomenclature of chemical compounds, also in a foreign language

K\_U24. Has the ability to self-study

#### Social competences

K\_K1. Is ready to critically assess his knowledge, understands the need for further education, supplementing specialized knowledge and raising his professional, personal and social competences, understands the importance of knowledge in solving problems and is ready to seek expert opinions

K\_K3. Is aware of the importance of understanding non-technical aspects and effects of engineering activities, including its impact on the environment and the associated responsibility for decisions, correctly recognizes problems and makes the right choices related to the exercise of the profession, in accordance with the principles of professional ethics, care for achievements and traditions profession

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during the course of the course is verified on the basis of the oral answer of the



student, his activity in class, as well as four written partial tests. Each test consists of five short open questions.

Assessment criteria: Student's preparedness for discussion during classes is assessed. In addition, each test question is rated on a scale of 2.0 - 5.0, with no score of 2.5. Passing threshold: giving a positive grade to three out of five questions and at the same time an average grade of five questions equal to or higher than 3.00

### Programme content

During the course, students discuss natural compounds selected from the basic classes, i.e. alkaloids, carbohydrates, steroids, terpenoids, peptides and proteins, nucleic and fatty acids, lipids and prostanoids and porphyrins. They learn about their nomenclature, chemical structure, reactivity and transformation possibilities, basic biological properties, possible applications, occurrence in the surrounding world as well as elements of total synthesis and biosynthesis

### Teaching methods

Students present in the form of a multimedia presentation the practical importance (use in industry) of selected biomolecules belonging to particular groups of compounds. In addition, discussion, case study, problem solving are used.

### Bibliography

#### Basic

1. Kafarski P., Lejczak B. Chemia bioorganiczna , Wydawnictwo Naukowe PWN, 1994.
2. Kołodziejczyk A. Naturalne związki organiczne , Wydawnictwo Naukowe PWN, 2012.
3. Wrzeciono U., Zaprutko L. Chemia związków naturalnych. Zagadnienia wybrane. , Wydawnictwa Uczelniane AM, 2001.

#### Additional

1. Patrick G. Chemia medyczna , Wydawnictwo Naukowo-Techniczne, 2003.
2. Stryer L. Biochemia , Wydawnictwo Naukowe PWN, 2005.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	30	1,0
Classes requiring direct contact with the teacher	20	0,6
Student's own work (literature studies, preparation for tutorials, preparation for tests) <sup>1</sup>	10	0,4

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