



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Biochemistry [S1IFar2>Biochemia]

Course

Field of study

Pharmaceutical Engineering

Year/Semester

2/3

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

15

Laboratory classes

15

Other

0

Tutorials

15

Projects/seminars

0

Number of credit points

4,00

Coordinators

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dr hab. Michał Sobkowski

dr Dorota Jakubczyk

Lecturers

Prerequisites

Basic knowledge of inorganic and organic chemistry, including analytical methods and thermodynamics.

Course objective

Acquiring knowledge on the structure and function of biomolecules and reactions occurring in the body that molecular target for drug action.

Course-related learning outcomes

Knowledge:

1. Has knowledge of physicochemical and biological foundations health sciences to the extent appropriate for pharmaceutical engineering, with basic issues within the scope of biochemistry.[K_W5]
2. Has a basic knowledge of methods of searching for new substances medicinal, plant and synthetic medicine and their biochemical and molecular form target points.[K_W24]
3. Has detailed knowledge of substances for pharmaceutical and cosmetic use, dietary supplements,

plant materials in relation to metabolism and metabolic changes occurring in the body and cell. [K_W25]

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Skills:

1. Can use the basic equipment and apparatus used in engineering pharmaceutical, receives pharmaceutically active substances using synthetic and biotechnological methods, isolates active bodies from plant materials based on knowledge of basic operations physical and chemical as well as biochemical and molecular processes, develops the form of the drug, performs research in the field of character quality assessment drug, interprets and documents the results of product quality tests. [K_U9]
2. Has the ability to conduct chemical, pharmaceutical and research toxicological pharmaceutical active substances and medicinal products. [K_U10]
3. Has the ability to self-study. [K_U24]

Social competences:

1. Is ready to critically assess knowledge, understands the need for further training complementing one's own knowledge and raising one's own professional, personal and social competences, understands the meaning knowledge in solving problems and is ready to consult experts. [K_K1]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Introductory tests to each laboratory exercise and evaluation of laboratory protocols; final exam verifying the knowledge of lectures content. (stationary or remote form depending on the epidemiological situation).

Programme content

The program covers the following topics:

1. Structure and biological function of proteins, nucleic acids, carbohydrates, lipids, hormones and vitamins.
2. Structure and function of biological membranes.
3. Major metabolic pathways and their interdependence.

Course topics

Lectures:

Structure and biological function of proteins, nucleic acids, carbohydrates, lipids, hormones and vitamins;

Structure and function of biological membranes and mechanisms of transport across membranes;

Main metabolic pathways and their interrelationship; metabolism regulation mechanisms; the influence of drugs on these processes;

Xenobiotics metabolizing systems.

Laboratory courses/tutorials:

Preparation of biomolecules: proteins, polysaccharides, nucleic acids; assessment of their properties - characteristic reactions and quantitative analysis;

Assessment of the effect of selected drugs on their target metabolic pathways.

Teaching methods

Lectures: presentations and multimedia shows; discussion with students; Laboratory exercises

Bibliography

Basic:

1. Murray R.K., Granner D.K., Mayes P.A., Rodwell V.W.: Biochemia Harpera PZWL.
2. Berg J.M., Tymoczko J.L., Stryer L.: Biochemia PWN.
3. Cichocki M. Biochemiczne i molekularne podstawy biotransformacji ksenobiotyków. WN UMP 2015

Additional:

1. Denis R Ferrier Lippicott Illustrated Reviews Biochemia EDRA 2018; Selected source materials

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	50	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	50	2,00