COURSE DESCRIPTION CARD - SYLLABUS

Course name
Bioorganic chemistry with elements of synthesis [S1IFar2>CBzES]

Course

Field of study
Pharmaceutical Engineering

Year/Semester
2/4

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
15

Laboratory classes
0

Other
0

Tutorials
15

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

The student should have a basic knowledge of general and inorganic chemistry. He/she should know symbols of elements, principles of chemical bond formation. He should also have basic knowledge of organic chemistry (reactivity of amines, carboxylic acids, carbonyl compounds, substitution, addition, elimination, oxidation, reduction reactions), and basic knowledge of stereochemistry of organic compounds.

Course objective

Understanding the chemical structure of basic bio-molecules such as amino acids, proteins, carbohydrates, lipids and their derivatives. To learn about the reactivity of bio-molecules, which are of great importance in the functioning of organisms. The lecture will be extended to include information on methods of synthesising specific groups of compounds. To lay the foundations for a better understanding of the subject areas.

Course-related learning outcomes

Knowledge:
1. The students has a non-negligible knowledge of chemistry to the extent that it allows to understand chemical phenomena and processes [K_W3]

2. The students has systematized, theoretically supported general knowledge in general and inorganic, physical and analytical chemistry [K_W8]
3. The students knows the cell structure and functions of cell structures, biochemical basis of metabolic pathways [K_W6]
4. The student knows selected groups of bioactive compounds, their biochemical properties and effects on cells and living organisms [K_W8]

Skills:
1. Acquire information from literature, databases and other properly selected sources, also in English [K_U1]
2. Use basic laboratory techniques in synthesis, isolation and purification of chemical compounds, including bio-molecules and biologically active compounds [K_U3]
3. Apply analytical, simulation and experimental methods to formulating and solving research tasks under the supervision of a tutor [K_U7]

Social competences:
1. Can think and act in an entrepreneurial way [K_K6]
2. Understands the need for further education and improving his/her professional, personal and social competences [K_K1]
3. Is able to appropriately determine priorities for the implementation of the assigned task [K_K4]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired in the lecture and tutorials is verified during a written credit at the end of the semester (stationary or remote form depending on the epidemiological situation). Credit threshold: 50% of the points.

Programme content

Lectures and tutorials: discussion of topics related to:
1. structure and properties of amino acids, peptides, proteins, carbohydrates
2. synthesis and applications of amino acids and peptides
3. basic reactions of monosaccharides (oxidation and reduction reactions of monosaccharides, glycosides and polysaccharides)
4. structure and reactivity of lipids (fats, fatty acids, terpenes, steroids, phospholipids).

Course topics

none

Teaching methods

1. Lecture with a multimedia presentation, discussion with students.

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, Warszawa.
3. Cichocki M. Biochemiczne i molekularne podstawy biotransformacji ksenobiotyków. WN UMP 2015

Additional:
1. Kączkowski J.: Podstawy biochemii, PWN, Warszawa.
2. Hames B.D., Hooper N.M., Houghton J.D.: Biochemia - krótkie wykłady, PWN, Warszawa.

Breakdown of average student's workload

	Hours	ECTS
Total workload	55	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00