



Subject card

|   |  |  |  |                                     |         |  |     |
|---|--|--|--|-------------------------------------|---------|--|-----|
| Subject name and code                       | BASIC OF BIOCHEMISTRY, PG_00048064   |  |  |                                     |         |  |     |
| Field of study                              | Chemistry  |  |  |                                     |         |  |     |
| Date of commencement of studies             | October 2021   | Academic year of realisation of subject                  |  |                                     |         | 2023/2024  |     |
| Education level                             | first-cycle studies  | Subject group  |  |                                     |         | Obligatory subject group in the field of study<br>Subject group related to scientific research in the field of study |     |
| Mode of study                               | Full-time studies  | Mode of delivery   |  |                                     |         | at the university  |     |
| Year of study                               | 3  | Language of instruction                                  |  |                                     |         | Polish   |     |
| Semester of study                           | 6  | ECTS credits   |  |                                     |         | 2.0  |     |
| Learning profile                            | general academic profile   | Assessment form  |  |                                     |         | assessment   |     |
| Conducting unit                             | Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry   |  |  |                                     |         |  |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor   | dr hab. inż. Iwona Gabriel                               |  |                                     |         |  |     |
|   | Teachers   | dr hab. inż. Iwona Gabriel                               |  |                                     |         |  |     |
| Lesson types and methods of instruction     | Lesson type  | Lecture  | Tutorial   | Laboratory                          | Project | Seminar  | SUM |
|   | Number of study hours  | 30.0   | 0.0  | 0.0                                 | 0.0     | 0.0  | 30  |
|   | E-learning hours included: 0.0   |  |  |                                     |         |  |     |
| Learning activity and number of study hours | Learning activity  | Participation in didactic classes included in study plan |  | Participation in consultation hours |         | Self-study   | SUM |
|   | Number of study hours  | 30   |  | 5.0                                 |         | 15.0   | 50  |
| Subject objectives                          | The main objective of the course is to gain knowledge about the structure and role of components of living cells, including proteins, nucleic acids, polysaccharides and lipids, as well as the main pathways of cellular metabolism.  |  |  |                                     |         |  |     |
| Learning outcomes                           | Course outcome   |  | Subject outcome  |                                     |         | Method of verification   |     |
|   | K6_W02   |  | The student knows the basic principles of the structure of biomacromolecules.  |                                     |         | [SW1] Assessment of factual knowledge  |     |
|   | [K6_W05] knows and understands the chemical processes and algorithms of mathematical models which are necessary for the design of technological processes, knows chemical structure of contemporary materials and its relation to their properties, enabling the selection of the materials for sustainable development technology and material-efficient and energy-efficient methods |  | The student knows the physical and biochemical basis of biocatalysis.  |                                     |         | [SW1] Assessment of factual knowledge  |     |
|   | [K6_W06] has a basic knowledge about the use of micro-organisms and their metabolic products in the production of goods and services, taking into account, inter alia, the role of genetic engineering, necessary for the application of biotechnological processes in various areas: food, chemical and mining industries, fuel production, agriculture and environmental protection  |  | The student knows the basic experimental techniques in the field of biochemistry. The student knows the main metabolic pathways and is able to assess the consequences of metabolic disorders. |                                     |         | [SW1] Assessment of factual knowledge  |     |

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| Subject contents   | 1. Biomolecules - amino acids, peptides and proteins 2. Biomolecules - sugars and polysaccharides 3. Biomolecules - lipids. Structure of biological membranes, transport 4. Enzymes - structure, mechanisms of action and activity regulation 5. Main catabolic pathways - glycolysis, Krebs cycle, respiratory chain, fatty acid oxidation 6. Examples of anabolic pathways 7. High-energy compounds 8. Integration and regulation of metabolism 9. Gene expression. Genetic code 10. DNA replication 11. DNA mutations, mechanisms of mutagenesis and DNA damage repair 12. Etiology of inborn metabolic diseases 13. Transcription 14. Protein biosynthesis. 15. Biochemistry of selected physiological processes |   |                               |
| Prerequisites and co-requisites                                | Knowledge of issues in the field of general chemistry: chemical bonds; intermolecular interactions; types and mechanisms of chemical reactions; properties of water, aqueous solutions. Knowledge of issues in the field of organic and physical chemistry: organic compounds - types and reactivity; theory of catalysis, thermodynamics.   |   |                               |
| Assessment methods and criteria                                | Subject passing criteria   | Passing threshold   | Percentage of the final grade |
|  | Test I   | 50.0%   | 50.0%                         |
|  | Test II  | 50.0%   | 50.0%                         |
| Recommended reading  | Basic literature   | Harpers Illustrated Biochemistry , 2018, ed. VII; Victor W. Rodwell, David A. Bender, Kathleen M. Botham, Peter J. Kennelly, Anthony P. Weil; Publisher: PZWL |                               |
|  | Supplementary literature   | Biochemistry; 2018; Berg Jeremy M. , Tymoczko John L. , Stryer Lubert , Gatto Gregory J. Publisher PWN;   |                               |
|  | eResources addresses   | Adresy na platformie eNauczenie:  |                               |
| Example issues/<br>example questions/<br>tasks being completed | not applicable   |   |                               |
| Work placement   | Not applicable   |   |                               |

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