

## Subject card

|                                             |                                                                                                              |                                                          |                                         |                                     |                                                                                                                      |            |     |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Biochemistry, PG_00081919                                                                                    |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Field of study                              | Chemistry                                                                                                    |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Date of commencement of studies             | October 2026                                                                                                 |                                                          | Academic year of realisation of subject |                                     | 2027/2028                                                                                                            |            |     |
| Education level                             | Bachelor's 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                               | 2                                                                                                            |                                                          | Language of instruction                 |                                     | Polish                                                                                                               |            |     |
| Semester of study                           | 4                                                                                                            |                                                          | ECTS credits                            |                                     | 1.0                                                                                                                  |            |     |
| Learning profile                            | academic                                                                                                     |                                                          | Assessment form                         |                                     | credit                                                                                                               |            |     |
| Conducting unit                             | Laboratory of Bioorganic Chemistry -> Department of Molecular Biochemistry -> Faculty of Chemistry -> Rector |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                           |                                                          | prof. dr hab. Krzysztof Rolka           |                                     |                                                                                                                      |            |     |
|                                             | Teachers                                                                                                     |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Lesson types                                | Lesson type                                                                                                  | Lecture                                                  | Tutorial                                | Laboratory                          | Project                                                                                                              | Seminar    | SUM |
|                                             | Number of study hours                                                                                        | 0.0                                                      | 15.0                                    | 0.0                                 | 0.0                                                                                                                  | 0.0        | 15  |
|                                             | 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                                                                                        | 15                                                       |                                         | 2.0                                 |                                                                                                                      | 8.0        | 25  |
| Subject objectives                          | To introduce students to the basic endogenous organic compounds, their structure and functions;              |                                                          |                                         |                                     |                                                                                                                      |            |     |

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| Learning outcomes                                              | Course outcome                                                                                                                                                                                                                                                                                                                                                                                          | Subject outcome                                                                                                                                                                                                                                              | Method of verification                                                                |
|                                                                | [CHEML3_W02] Describes the properties of elements and the most important chemical compounds, enumerates the methods of their preparation and methods of analysis.                                                                                                                                                                                                                                       | Characterizes basic analytical methods of endogenous, organic compounds.                                                                                                                                                                                     | [SW4] test/exam - oral or written<br>[SW1] oral statement/<br>conversation/discussion |
|                                                                | [CHEML3_W01] Enumerates basic laws and theories in chemistry, physics, mathematics and biology.                                                                                                                                                                                                                                                                                                         | Defines and demonstrates chemical structure of basic groups of bio- and macromolecules. Explains their importance for the body functioning. Understands influence of diet on physical condition of the body.                                                 | [SW4] test/exam - oral or written<br>[SW1] oral statement/<br>conversation/discussion |
|                                                                | [CHEML3_K06] Raises her/his professional and personal competences by using information provided in various sources.                                                                                                                                                                                                                                                                                     | Understands the need of continuous education. Appreciates the need of ability to team work according to assigned role (team leader/team member). Is aware of the need of critical analysis of own work. Is aware of the necessity of fair and reliable work. | [SK1] oral statement/conversation/<br>discussion<br>[SK4] test/exam - oral or written |
|                                                                | [CHEML3_U09] Is able to learn independently.                                                                                                                                                                                                                                                                                                                                                            | Predicts physicochemical and biological properties of organic compounds based on their chemical formulas.                                                                                                                                                    | [SU1] oral statement/conversation/<br>discussion<br>[SU4] test/exam - oral or written |
|                                                                | [CHEML3_K03] Establishes priorities in the right way for the implementation of tasks specified by herself/himself and/or by others.                                                                                                                                                                                                                                                                     | Is aware of the need of critical analysis of own work. Is aware of the necessity of fair and reliable work.                                                                                                                                                  | [SK1] oral statement/conversation/<br>discussion<br>[SK4] test/exam - oral or written |
| Subject contents                                               | Chemical structure, physicochemical properties and biological functions of: proteins, peptides, nucleic acids, lipids, phospholipids, mono- and polysaccharides                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                              |                                                                                       |
| Prerequisites and co-requisites                                | Organic chemistry (bachelor level), fundamentals of organic chemistry.                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                              |                                                                                       |
| Assessment methods and criteria                                | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                | Passing threshold                                                                                                                                                                                                                                            | Percentage of the final grade                                                         |
|                                                                | passing two written tests covering the content of the classes and activity in classes                                                                                                                                                                                                                                                                                                                   | 51.0%                                                                                                                                                                                                                                                        | 100.0%                                                                                |
| Recommended reading                                            | Basic literature                                                                                                                                                                                                                                                                                                                                                                                        | J. M. Berg, J. L. Tymoczko, L. Stryer, Biochemia, PWN, Warszawa2009 and and subsequent editions                                                                                                                                                              |                                                                                       |
|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                | other academic textbooks for biochemistry and bioorganic chemistry.                                                                                                                                                                                          |                                                                                       |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                              |                                                                                       |
| Example issues/<br>example questions/<br>tasks being completed | Write the structural formulas of threonine and determine the absolute and relative configuration of the carbon atoms of the isomer present in the protein.Discuss the canonical secondary structures of proteins and the interactions that stabilize them.Using chemical reactions, present the mechanism of lactose hydrolysis in an acidic conditions.Discuss and give examples of passive transport. |                                                                                                                                                                                                                                                              |                                                                                       |
| Work placement                                                 | Not applicable                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                              |                                                                                       |

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