

## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                                                                                            |                                                          |                                         |                                     |                                                                                                                      |            |     |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Introduction to biochemistry, PG_00154255                                                                                                                                                                                                                                                                                                                                                  |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Field of study                              | Medical Biology                                                                                                                                                                                                                                                                                                                                                                            |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Date of commencement of studies             | October 2025                                                                                                                                                                                                                                                                                                                                                                               |                                                          | Academic year of realisation of subject |                                     | 2026/2027                                                                                                            |            |     |
| 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                           | 3                                                                                                                                                                                                                                                                                                                                                                                          |                                                          | ECTS credits                            |                                     | 3.0                                                                                                                  |            |     |
| Learning profile                            | academic                                                                                                                                                                                                                                                                                                                                                                                   |                                                          | Assessment form                         |                                     | credit                                                                                                               |            |     |
| Conducting unit                             | Laboratory of Microbial Biochemistry -> Department of General and Medical Biochemistry -> Faculty of Biology -> Rector                                                                                                                                                                                                                                                                     |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                                                                                         |                                                          | dr inż. Karolina Stojowska-Swędryńska   |                                     |                                                                                                                      |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                                                                                                   |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                                                                                                                                                                                | Lecture                                                  | Tutorial                                | Laboratory                          | Project                                                                                                              | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                                                      | 0.0                                                      | 0.0                                     | 30.0                                | 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                                                       |                                         | 6.0                                 |                                                                                                                      | 39.0       | 75  |
| Subject objectives                          | The aim of the exercises is to familiarize students with the structure and function of macromolecules (nucleic acids, proteins, sugars, lipids) and with laboratory biochemical techniques used to analyze macromolecules and biochemical processes. An additional goal is for students to acquire the ability to independently perform biochemical experiments and interpret the results. |                                                          |                                         |                                     |                                                                                                                      |            |     |

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| Learning outcomes               | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Subject outcome                                                                                                                                                                                                                                    | Method of verification                                                                                                       |
|                                 | [BIOLMEDL3_U01] uses basic apparatus and research tools and, maintaining the correct sequence of operations, performs simple physical, biological or chemical observations and measurements in laboratory work in the biological or medical sciences                                                                                                                                                                                                                                                                                                                                                                                                                                       | The student uses basic research equipment and tools and, maintaining the correct sequence of activities, performs simple biochemical and physical observations and measurements in laboratory work in the field of biological or medical sciences. | [SU2] presentation/project/paper/report                                                                                      |
|                                 | [BIOLMEDL3_U11] is able to use language specialized for medical biology in a way that is clear and accessible to both specialists and non-specialists alike                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Is able to use the language specialized in medical biology (with particular emphasis on biochemical terms) in a way that is understandable and accessible to both specialists and non-specialists.                                                 | [SU1] oral statement/conversation/discussion<br>[SU2] presentation/project/paper/report<br>[SU4] test/exam - oral or written |
|                                 | [BIOLMEDL3_K05] jest odpowiedzialny za bezpieczeństwo pracy własnej i innych oraz potrafi rozpoznać sytuacje zagrożenia i podjąć odpowiednie działania                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | The student is responsible for their own safety and the safety of others, and is able to recognize hazardous situations and take appropriate actions.                                                                                              | [SK8] observation of student's independent or team work                                                                      |
|                                 | [BIOLMEDL3_W10] understands and describes the physicochemical and biological basis of health sciences                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Understands and describes the physicochemical and biological basis of health sciences and understands the basics of methodology.                                                                                                                   | [SW4] test/exam - oral or written                                                                                            |
|                                 | [BIOLMEDL3_W02] describes the structure and properties of basic types of biological macromolecules, molecular mechanisms of the pathways of basal metabolism and flow of genetic information, and sources of variation in organisms; explains the rules of inheritance                                                                                                                                                                                                                                                                                                                                                                                                                     | The student describes the structure, properties and functions of basic types biological macromolecules and mechanisms of biochemical methods.                                                                                                      | [SW4] test/exam - oral or written                                                                                            |
|                                 | [BIOLMEDL3_K07] Is responsible for the equipment/materials entrusted to him and his own work and respects the work of others                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | The student is responsible for the provided laboratory equipment, instruments, materials and reagents. He is responsible for his own work and respects the work of others.                                                                         | [SK8] observation of student's independent or team work                                                                      |
| Subject contents                | <ul style="list-style-type: none"> <li>Structure, function and properties of basic macromolecules: nucleic acids, proteins, carbohydrates, lipids.</li> <li>Methods of separation and analysis of nucleic acids and proteins (agarose and polyacrylamide electrophoresis).</li> <li>Methods of identification and analysis of biochemical properties of selected macromolecules.- Methods of separating molecules due to differences in molecular weight (molecular filtration).</li> <li>Structure and functions of enzymes, methods of determining enzymatic activity, enzyme inhibition.</li> <li>Chromatographic methods (thin layer chromatography, paper chromatography).</li> </ul> |                                                                                                                                                                                                                                                    |                                                                                                                              |
| Prerequisites and co-requisites | Completion of courses covering general and organic chemistry. Knowledge of the structure of basic inorganic and organic compounds, isomerism, chemical bonds, mechanisms of basic chemical reactions, energetics of chemical reactions, hydrophobic interactions, acids and bases, pH, units of measurement, solution concentration units, ability to calculate solution concentrations.                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                    |                                                                                                                              |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Passing threshold                                                                                                                                                                                                                                  | Percentage of the final grade                                                                                                |
|                                 | Written reports of laboratory experiments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 50.1%                                                                                                                                                                                                                                              | 30.0%                                                                                                                        |
|                                 | Test with closed and open questions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 50.1%                                                                                                                                                                                                                                              | 70.0%                                                                                                                        |
| Recommended reading             | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>Instructions for laboratory classes (provided by the laboratory coordinator) (in Polish)</li> </ul>                                                                                                         |                                                                                                                              |

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|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                                                         | (Textbooks in Polish): <ul style="list-style-type: none"> <li>• Berg J. M., Tymoczko J. L., Stryer L. 2017. Biochemia. PWN, Warszawa</li> <li>• Berg J. M., Stryer L. , Tymoczko J. L., Biochemia. Krótki kurs. PWN Warszawa 2013</li> <li>• Kłyszewko-Stefanowicz L. (red.). 2005. Ćwiczenia z biochemii. PWN, Warszawa</li> <li>• Hames B. D., Hooper N.M. 2007. Krótkie wykłady: Biochemia. PWN, Warszawa</li> </ul> |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Example issues/<br>example questions/<br>tasks being completed | Differences in the structure of RNA and DNA, characteristic features of plasmid DNA, amino acid structure, what is the isoelectric point, what is molecular filtration, what is the active center of the enzyme, list the differences between competitive and non-competitive inhibition, What is the Biuret reaction used for, what is an amphiphilic molecule. |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Work placement                                                 | Not applicable                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                         |

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