

## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                     |                                                          |                                         |                                     |                                                                                                                      |            |     |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Microbiology, PG_00203333                                                                                                                                                                                                                                                                                           |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Field of study                              | Medical Biology                                                                                                                                                                                                                                                                                                     |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Date of commencement of studies             | October 2026                                                                                                                                                                                                                                                                                                        |                                                          | 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                               | 1                                                                                                                                                                                                                                                                                                                   |                                                          | Language of instruction                 |                                     | Polish                                                                                                               |            |     |
| Semester of study                           | 2                                                                                                                                                                                                                                                                                                                   |                                                          | ECTS credits                            |                                     | 4.0                                                                                                                  |            |     |
| Learning profile                            | academic                                                                                                                                                                                                                                                                                                            |                                                          | Assessment form                         |                                     | exam                                                                                                                 |            |     |
| Conducting unit                             | Department of Microbiology -> Faculty of Biology -> Rector                                                                                                                                                                                                                                                          |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                  |                                                          | dr hab. Magdalena Plotka                |                                     |                                                                                                                      |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                            |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Lesson types                                | 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                                                       |                                         | 4.0                                 |                                                                                                                      | 66.0       | 100 |
| Subject objectives                          | Understanding the relationship between structure and function in relation to microorganisms, the relationship between basic metabolic processes, the mechanisms regulating bacterial metabolism, the factors determining the virulence of bacteria and viruses, and methods of preventing and combating infections. |                                                          |                                         |                                     |                                                                                                                      |            |     |

| Learning outcomes               | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Subject outcome                                                                                                                                                                | Method of verification            |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
|                                 | [BIOLMEDL3_W01] has an advanced knowledge and understanding of the differences in the structure and function of prokaryotic and eukaryotic cells, the structure and properties of the various types of biological macromolecules, the molecular mechanisms of basic metabolic pathways and the flow of genetic information, and the sources of variation in organisms; explains the laws of inheritance                                                                                                                                         | Components and explains the differences in the structure and functioning of prokaryotic and eukaryotic cells.                                                                  | [SW4] test/exam - oral or written |
|                                 | [BIOLMEDL3_W10] has an advanced understanding of the principles of assessing processes and phenomena occurring within the body, using physical or chemical measurements, and possesses advanced knowledge of experimental methods and the key techniques of the biological sciences that may be applied in medical biology and diagnostics                                                                                                                                                                                                      | Explains the theoretical basis of experimental methods and lists the most important techniques in microbiology that can be used in medical biology and diagnostics.            | [SW4] test/exam - oral or written |
|                                 | [BIOLMEDL3_W03] has an advanced knowledge and understanding of the characteristics, systematics and evolution of selected groups of organisms, taking into account their molecular basis, and describes the fundamental concepts and mechanisms of evolution; furthermore, the student describes, explains and compares, at an advanced level, the systemic regulatory mechanisms in animal and human organisms (including from an ontogenetic and phylogenetic perspective) and understands the neurobiological and genetic basis of disorders | Characterization, systematics, and evolution of selected groups of microorganisms, considering the molecular foundations and fundamental concepts and mechanisms of evolution. | [SW4] test/exam - oral or written |
| Subject contents                | Functional anatomy of bacteria, basic metabolic processes of bacteria, conditions of bacterial growth, regulation of bacterial metabolism, control of bacterial growth, genetics of bacteria and viruses, mutagenesis and mutational variability of bacteria, fundamentals of virology, microbiological mechanisms of pathogenesis, pathogenic microorganisms, and use of microorganisms in biotechnology.                                                                                                                                      |                                                                                                                                                                                |                                   |
| Prerequisites and co-requisites | Completed organic chemistry course.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                |                                   |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Passing threshold                                                                                                                                                              | Percentage of the final grade     |
|                                 | Test exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 51.0%                                                                                                                                                                          | 100.0%                            |
| Recommended reading             | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Madigan, M.T., Martinko, J.M., Dunlap, P.V. and Clark, D.P.: Brock Biology of Microorganisms, Pearson                                                                          |                                   |
|                                 | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Murphy, K.: Janeway's Immunobiology, Garland Science                                                                                                                           |                                   |
|                                 | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                |                                   |

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| Example issues/<br>example questions/<br>tasks being completed | <p>1. Lipid A is a component of:</p> <p>a) lipopolysaccharide of enterobacteria</p> <p>b) Brown's lipoprotein of <i>Escherichia coli</i></p> <p>c) cytoplasmic membrane phospholipids of Gram-negative bacteria</p> <p>d) lipids associated with murein of Gram-positive bacteria</p> <p>2. This bacterium produces a strong neurotoxin that affects peripheral nerves. This refers to:</p> <p>a) <i>Staphylococcus aureus</i></p> <p>b) <i>Bacillus anthracis</i></p> <p>c) <i>Bordetella pertussis</i></p> <p>d) <i>Clostridium botulinum</i></p> |
| Work placement                                                 | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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