

## Subject card

|                                             |                                                                                                                                                       |                                                          |                                         |                                     |                                                                                                                      |            |     |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Preparation of biomolecules. Structure and function of proteins, PG_00147199                                                                          |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Field of study                              | Genetics and Experimental Biology                                                                                                                     |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Date of commencement of studies             | October 2025                                                                                                                                          |                                                          | 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                               | 3                                                                                                                                                     |                                                          | Language of instruction                 |                                     | Polish                                                                                                               |            |     |
| Semester of study                           | 5                                                                                                                                                     |                                                          | 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 hab. Dorota Kuczyńska-Wiśnik         |                                     |                                                                                                                      |            |     |
|                                             | Teachers                                                                                                                                              |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Lesson types                                | Lesson type                                                                                                                                           | Lecture                                                  | Tutorial                                | Laboratory                          | Project                                                                                                              | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                 | 0.0                                                      | 0.0                                     | 45.0                                | 0.0                                                                                                                  | 0.0        | 45  |
|                                             | 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                                                                                                                                 | 45                                                       |                                         | 5.0                                 |                                                                                                                      | 25.0       | 75  |
| Subject objectives                          | familiarizing students with methods of protein isolation from a natural source and isolation of recombinant proteins from various expression systems( |                                                          |                                         |                                     |                                                                                                                      |            |     |

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| Learning outcomes                                                       | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Subject outcome                                                                                                                                                                                                                                                                                                                                                                                                                        | Method of verification                                                                                                                       |
|                                                                         | [GBEL3_W05] the principles of research planning based on achievements in biological sciences and related fields, the potential application of their results in practice, the principles of operation of equipment and apparatus used in molecular genetics research, and the principle of interpreting biological phenomena and processes based on empirical data in research and practical activities, with consideration for sustainable use of biological diversity. | Knows the principles of planning research based on the achievements of biological sciences and the possibilities of using their results in practice, the principles of operation of equipment and apparatus used in molecular genetics research and the principle of interpreting biological phenomena and processes based on empirical data in research and practical activities, taking into account sustainable use of biodiversity | [SW4] test/exam - oral or written<br>[SW1] oral statement/conversation/discussion<br>[SW2] presentation/project/paper/report                 |
|                                                                         | [GBEL3_K08] Responsibility for entrusted equipment/materials and respect for the work of others.                                                                                                                                                                                                                                                                                                                                                                        | Is responsible for the entrusted equipment/materials and respects the work of others                                                                                                                                                                                                                                                                                                                                                   | [SK8] observation of student's independent or team work                                                                                      |
|                                                                         | [GBEL3_K01] The utilization of theoretical knowledge in laboratory and production practice.                                                                                                                                                                                                                                                                                                                                                                             | Is ready to use theoretical knowledge in laboratory practice                                                                                                                                                                                                                                                                                                                                                                           | [SK2] presentation/project/paper/report<br>[SK8] observation of student's independent or team work                                           |
|                                                                         | [GBEL3_U08] Independently study literature and plan one's own career path.                                                                                                                                                                                                                                                                                                                                                                                              | Is able to work in a team and organize work                                                                                                                                                                                                                                                                                                                                                                                            | [SU8] observation of student's independent or team work                                                                                      |
|                                                                         | [GBEL3_U01] Independently perform practical tasks in the field of biological sciences and related disciplines, formulate research problems, analyze their results, and draw conclusions.                                                                                                                                                                                                                                                                                | Can independently perform simple practical tasks in the field of biological and related sciences                                                                                                                                                                                                                                                                                                                                       | [SU5] implementation of a problem task<br>[SU6] demonstration of practical skills<br>[SU8] observation of student's independent or team work |
|                                                                         | [GBEL3_U03] Proficient in using research equipment and tools, while following the correct sequence of procedures, to conduct basic physical, biological, or chemical observations and measurements in laboratory work within the field of biological sciences.                                                                                                                                                                                                          | uses basic research equipment and tools and, maintaining the correct sequence of activities, performs simple physical, biological or chemical observations and measurements in laboratory work in the field of biological sciences                                                                                                                                                                                                     | [SU2] presentation/project/paper/report<br>[SU8] observation of student's independent or team work                                           |
| [GBEL3_K05] Responsibility for the safety of one's own work and others. | is responsible for his own and others' work safety                                                                                                                                                                                                                                                                                                                                                                                                                      | [SK8] observation of student's independent or team work                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                              |
| Subject contents                                                        | Students purify proteins using classic preparation techniques                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                              |
| Prerequisites and co-requisites                                         | Passing the subjects biochemistry and molecular biology; Knowledge of basic information about the structure and synthesis of proteins                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                              |
| Assessment methods and criteria                                         | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                | Passing threshold                                                                                                                                                                                                                                                                                                                                                                                                                      | Percentage of the final grade                                                                                                                |
|                                                                         | test                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                  | 75.0%                                                                                                                                        |
|                                                                         | grade for the report                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                  | 25.0%                                                                                                                                        |
| Recommended reading                                                     | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1. Original source works from scientific magazines<br>2. Ćwiczenia z biochemii (Kłyszewko-Stefanowicz, L., red. PWN, Warszawa 1999)<br>3. Techniki laboratoryjne w biologii molekularnej (Lewandowska Roenneger A.; Medpharm, 2018)                                                                                                                                                                                                    |                                                                                                                                              |
|                                                                         | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                | J.M. Berg, J.L. Tymoczko, L. Stryer, Biochemia, 2009, PWN, Warszawa                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                              |
|                                                                         | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                              |
| Example issues/example questions/tasks being completed                  | Suggest a scheme for protein purification; Assign the given methods to research purposes;                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                              |
| Work placement                                                          | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                              |

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