

## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                   |                                                          |                                         |                                     |                                                |            |     |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|------------------------------------------------|------------|-----|
| Subject name and code                       | Statistical methods in biology and medicine, PG_00154705                                                                                                                                                                                                                                                          |                                                          |                                         |                                     |                                                |            |     |
| Field of study                              | Biology                                                                                                                                                                                                                                                                                                           |                                                          |                                         |                                     |                                                |            |     |
| Date of commencement of studies             | October 2025                                                                                                                                                                                                                                                                                                      |                                                          | Academic year of realisation of subject |                                     | 2025/2026                                      |            |     |
| Education level                             | Master's studies                                                                                                                                                                                                                                                                                                  |                                                          | Subject group                           |                                     | Obligatory subject group 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                           | 1                                                                                                                                                                                                                                                                                                                 |                                                          | ECTS credits                            |                                     | 2.0                                            |            |     |
| Learning profile                            | academic                                                                                                                                                                                                                                                                                                          |                                                          | Assessment form                         |                                     | credit                                         |            |     |
| Conducting unit                             | Laboratory of Avian Ecophysiology -> Department of Vertebrate Ecology and Zoology -> Faculty of Biology - > Rector                                                                                                                                                                                                |                                                          |                                         |                                     |                                                |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                |                                                          | prof. dr hab. Włodzimierz Meissner      |                                     |                                                |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                          |                                                          | prof. dr hab. Magdalena Remisiewicz     |                                     |                                                |            |     |
| 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                                 |                                                | 16.0       | 50  |
| Subject objectives                          | To understand the basic concepts related to descriptive statistics and the verification of statistical hypotheses. To learn and understand methods of analysing numerical data. To acquire the ability to select methods for statistical analysis. To acquire skills in the use of computer statistical programs. |                                                          |                                         |                                     |                                                |            |     |

| Learning outcomes               | Course outcome                                                                                                                                                                                                                                                                         | Subject outcome                                                                                                                                                                                                                                                                                                                                                                                                                                            | Method of verification            |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
|                                 | [BIOLMU2_K06] the graduate is prepared to take responsibility for assessing the risks arising from the research techniques used and for creating ergonomic and safe working conditions                                                                                                 | Ability to assess potential problems arising from faulty data analysis.                                                                                                                                                                                                                                                                                                                                                                                    | [SK4] test/exam - oral or written |
|                                 | [BIOLMU2_U06] the graduate is able to use the acquired expertise in the biological sciences to interpret the collected empirical data and to make inferences                                                                                                                           | Ability to interpret the results of statistical analysis.                                                                                                                                                                                                                                                                                                                                                                                                  | [SU4] test/exam - oral or written |
|                                 | [BIOLMU2_U05] the graduate is able to use statistical methods and computer techniques and tools to describe biological phenomena and analyse specialised data                                                                                                                          | Ability to use learned data analysis techniques to describe biological phenomena, including data of a specialised nature.                                                                                                                                                                                                                                                                                                                                  | [SU4] test/exam - oral or written |
|                                 | [BIOLMU2_W02] the graduate knows and applies the principle of strict, empirically based interpretation of biological phenomena and processes in research work and practical activities                                                                                                 | Ability to correctly interpret the results of statistical analysis.                                                                                                                                                                                                                                                                                                                                                                                        | [SW4] test/exam - oral or written |
|                                 | [BIOLMU2_W07] the graduate is familiar with specialised bioinformatics tools, useful in solving problems of the studied specialisation of biological sciences                                                                                                                          | Ability to use specialised software for statistical analysis of data.                                                                                                                                                                                                                                                                                                                                                                                      | [SW4] test/exam - oral or written |
|                                 | [BIOLMU2_W06] the graduate is familiar with advanced statistical tools relevant to the problems of the biological sciences specialisation studied                                                                                                                                      | Ability to use methods of statistical analysis of data.                                                                                                                                                                                                                                                                                                                                                                                                    | [SW4] test/exam - oral or written |
| Subject contents                | Reinforcement of basic concepts in descriptive statistics and statistical hypothesis testing. Testing hypotheses about differences between means and relationships between variables. Analysis of covariance. Linear models. Ways of assessing the consistency of measurement methods. |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                   |
| Prerequisites and co-requisites |                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                   |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                               | Passing threshold                                                                                                                                                                                                                                                                                                                                                                                                                                          | Percentage of the final grade     |
|                                 | test of 30 questions                                                                                                                                                                                                                                                                   | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 100.0%                            |
| Recommended reading             | Basic literature                                                                                                                                                                                                                                                                       | Meissner W.2010. Przewodnik do ćwiczeń z przedmiotu metody statystyczne w biologii. Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk.                                                                                                                                                                                                                                                                                                                           |                                   |
|                                 | Supplementary literature                                                                                                                                                                                                                                                               | Stanisz A. 2006. Przystępny kurs statystyki z zastosowaniem STATISTICA PL na przykładach z medycyny. Tom 1. Statystyki podstawowe. StatSoft, Kraków.<br><br>Stanisz A. 2007. Przystępny kurs statystyki z zastosowaniem STATISTICA PL na przykładach z medycyny. Tom 2. Modele liniowe i nieliniowe. StatSoft, Kraków.<br><br>Ferguson G.A., Takane Y. 2008. Analiza statystyczna w psychologii i pedagogice. Wyd. III. Wydawnictwo Naukowe PWN, Warszawa. |                                   |
|                                 | eResources addresses                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                   |

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| Example issues/<br>example questions/<br>tasks being completed | <p>Selection of tests to compare two samples.</p> <p>Selection of tests to compare more than two samples.</p> <p>Correlation and regression.</p> <p>Analysis of covariance.</p> |
| Work placement                                                 | Not applicable                                                                                                                                                                  |

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