

## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                   |                                                          |                                         |                                     |                                                                                                                      |            |     |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Statistical methods in biology and medicine, PG_00154670                                                                                                                                                                                                                                                          |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Field of study                              | Metody statystyczne w biologii i medycynie - ćwiczenia laboratoryjne (Ćw. laboratoryjne)                                                                                                                                                                                                                          |                                                          |                                         |                                     |                                                                                                                      |            |     |
| 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<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                           | 1                                                                                                                                                                                                                                                                                                                 |                                                          | ECTS credits                            |                                     | 3.0                                                                                                                  |            |     |
| Learning profile                            | academic                                                                                                                                                                                                                                                                                                          |                                                          | Assessment form                         |                                     | credit                                                                                                               |            |     |
| Conducting unit                             |                                                                                                                                                                                                                                                                                                                   |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                |                                                          | prof. dr hab. Włodzimierz Meissner      |                                     |                                                                                                                      |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                          |                                                          | dr Katarzyna Stępniewska                |                                     |                                                                                                                      |            |     |
| 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                                                       |                                         | 8.0                                 |                                                                                                                      | 37.0       | 75  |
| 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. |                                                          |                                         |                                     |                                                                                                                      |            |     |

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|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Learning outcomes                                              | Course outcome                                                                                                                                                                                                                                                                                                                                                                                       | Subject outcome                                                                                                                                                  | Method of verification                                      |
|                                                                | [BIOLMEDMU2_U07] is able to show initiative and lead teamwork and cooperate in the planning and implementation of research tasks                                                                                                                                                                                                                                                                     | He is able to plan and organise team work.                                                                                                                       | [SU8] obserwacja samodzielnej lub zespołowej pracy studenta |
|                                                                | [BIOLMEDMU2_K08] is ready to lead the group and take responsibility for it                                                                                                                                                                                                                                                                                                                           | Able to work in a team, take responsibility for one's own work and that of others.                                                                               | [SK8] obserwacja samodzielnej lub zespołowej pracy studenta |
|                                                                | [BIOLMEDMU2_K02] is ready to recognize the importance of knowledge in solving cognitive and practical problems and to seek expert advice when having difficulty solving a problem on his own                                                                                                                                                                                                         | He thoroughly assesses his own competences related to the field of medical biology he is studying. He strives to continuously improve his competences.           | [SK8] obserwacja samodzielnej lub zespołowej pracy studenta |
|                                                                | [BIOLMEDMU2_U03] is able to formulate and solve problems on the basis of the known laws and methods, including - using computer tools and statistical methods                                                                                                                                                                                                                                        | He uses specialised computer software for statistical data analysis.                                                                                             | [SU4] test/egzamin - ustny lub pisemny                      |
|                                                                | [BIOLMEDMU2_W01] has an in-depth knowledge of scientific fields and disciplines relevant to medical biology and the studied specialty and knows their main development trends                                                                                                                                                                                                                        | Knows advanced statistical analysis tools relevant to the problems of the studied specialisation in medical biology.                                             | [SW4] test/egzamin - ustny lub pisemny                      |
|                                                                | [BIOLMEDMU2_W04] knows the principles of planning research based on the achievements of biological and medical sciences, the principles of operation of equipment and apparatus used in medical biology research, and the principle of interpreting biological phenomena and processes based on empirical data in research work and practical activities                                             | Selects and applies statistical analysis techniques and tools appropriate to the problems posed in the field of medical biology.                                 | [SW4] test/egzamin - ustny lub pisemny                      |
| Subject contents                                               | Descriptive statistics, statistical hypothesis testing, parametric and non-parametric tests, ANOVA, regression and correlation                                                                                                                                                                                                                                                                       |                                                                                                                                                                  |                                                             |
| Prerequisites and co-requisites                                |                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                  |                                                             |
| Assessment methods and criteria                                | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                             | Passing threshold                                                                                                                                                | Percentage of the final grade                               |
|                                                                |                                                                                                                                                                                                                                                                                                                                                                                                      | 51.0%                                                                                                                                                            | 33.0%                                                       |
|                                                                |                                                                                                                                                                                                                                                                                                                                                                                                      | 51.0%                                                                                                                                                            | 33.0%                                                       |
|                                                                |                                                                                                                                                                                                                                                                                                                                                                                                      | 51.0%                                                                                                                                                            | 34.0%                                                       |
| 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 Polska, Kraków.      |                                                             |
|                                                                |                                                                                                                                                                                                                                                                                                                                                                                                      | Stanisz A. 2007.Przystępny kurs statystyki z zastosowaniem STATISTICA PL na przykładach z medycyny. Tom 2. Modele liniowe i nieliniowe. StatSoft Polska, Kraków. |                                                             |
|                                                                |                                                                                                                                                                                                                                                                                                                                                                                                      | Ferguson G.A., Takane Y. 2008. Analiza statystyczna w psychologii i pedagogice. Wyd. III. Wydawnictwo Naukowe PWN, Warszawa.                                     |                                                             |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                  |                                                             |
| Example issues/<br>example questions/<br>tasks being completed | Selection of appropriate tests to verify hypotheses about differences between means and distributions: for two and for multiple samples. Testing the relationship between variables using correlation coefficients and linear, multiple and segmented regression. Practical application of attendance analysis in biological research. Preparation and analysis of graphs based on statistical data. |                                                                                                                                                                  |                                                             |
| Work placement                                                 | Not applicable                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                  |                                                             |

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