



Subject card

|   |   |  |   |                                     |  |            |     |
|---|---|--|---|-------------------------------------|--|------------|-----|
| Subject name and code                       | MATHEMATICAL STATISTICS, PG_00058556  |  |   |                                     |  |            |     |
| Field of study                              | Economic Analytics  |  |   |                                     |  |            |     |
| Date of commencement of studies             | October 2023  | Academic year of realisation of subject                  |   |                                     | 2024/2025  |            |     |
| Education level                             | first-cycle 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                               | Part-time studies   | Mode of delivery   |   |                                     | at the university  |            |     |
| Year of study                               | 2   | Language of instruction                                  |   |                                     | Polish   |            |     |
| Semester of study                           | 3   | ECTS credits   |   |                                     | 6.0  |            |     |
| Learning profile                            | general academic profile  | Assessment form  |   |                                     | exam   |            |     |
| Conducting unit                             | Katedra Statystyki i Ekonometrii -> Faculty of Management and Economics   |  |   |                                     |  |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor  |  | dr inż. Karol Flisikowski   |                                     |  |            |     |
|   | Teachers  |  |   |                                     |  |            |     |
| Lesson types and methods of instruction     | Lesson type   | Lecture  | Tutorial  | Laboratory                          | Project  | Seminar    | SUM |
|   | Number of study hours   | 16.0   | 0.0   | 16.0                                | 0.0  | 0.0        | 32  |
|   | 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   | 32   |   | 15.0                                |  | 103.0      | 150 |
| Subject objectives                          | Selects and uses appropriate statistical methods to analyze data, using statistical software to process and interpret the results.  |  |   |                                     |  |            |     |
| Learning outcomes                           | Course outcome  |  | Subject outcome   |                                     | Method of verification   |            |     |
|   | [K6_U07] uses information technologies to improve data analysis and decision-making processes   |  | uses statistical software to improve analysis of mass data to support decision-making processes   |                                     | [SU4] Assessment of ability to use methods and tools<br>[SU2] Assessment of ability to analyse information           |            |     |
|   | [K6_W05] integrates data from multiple sources to analyze complex economic problems   |  | integrates data from multiple sources and, using a variety of statistical methods, obtains results usable in practical multidisciplinary applications |                                     | [SW1] Assessment of factual knowledge  |            |     |
| Subject contents                            | <p>Population and sample.<br/>Distributions of discrete and continuous random variables.<br/>Basic statistics and their distributions.<br/>Estimators and their properties.<br/>Point estimation.<br/>Interval estimation.<br/>Testing of statistical hypotheses.<br/>Significance level and power of a test.<br/>Parametric tests for one-dimensional populations.<br/>Parametric tests for two-dimensional populations.<br/>Tests for multidimensional populations.<br/>ANOVA. ANCOVA.<br/>MANOVA. MANCOVA.<br/>Nonparametric tests.<br/>Goodness of fit test. Normality tests.<br/>Chi-square test of independence.<br/>Randomness tests.<br/>Sign tests.<br/>The runs test.</p> |  |   |                                     |  |            |     |
| Prerequisites and co-requisites             | probability theory, descriptive statistics  |  |   |                                     |  |            |     |

| Assessment methods and criteria                                | Subject passing criteria   | Passing threshold  | Percentage of the final grade |
|--|--|--|-------------------------------|
|  | Lecture - Final Exam   | 60.0%  | 50.0%                         |
|  | Laboratory - Tests and Quizzes   | 60.0%  | 50.0%                         |
| Recommended reading  | Basic literature   | Wickham, H., Golemund, G. (2017). R for Data Science. Import, Tidy, Transform, Visualize, and Model Data, O'Reilly.<br>Ramachandran, K., Tsokos, C. P. (2020). Mathematical Statistics with Applications in R, Elsevier LTD. |                               |
|  | Supplementary literature   | Field, Z., Miles, J. (2022). Discovering Statistics Using R. SAGE Publications Ltd.  |                               |
|  | eResources addresses   | Adresy na platformie eNauczanie:   |                               |
| Example issues/<br>example questions/<br>tasks being completed | A calculus task in probability and central limit theorems.<br>A calculus task in point and interval estimation.<br>Testing of parametric hypotheses.<br>Testing of non-parametric hypotheses.<br>Examination - theoretical issues. |  |                               |
| Work placement   | Not applicable   |  |                               |