



## Subject card

|                                             |                                                                                                                                                                                                        |                                                          |                                                                                                                                                                            |                                     |                                                                                                                      |            |     |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | DESCRIPTIVE STATISTICS, PG_00070588                                                                                                                                                                    |                                                          |                                                                                                                                                                            |                                     |                                                                                                                      |            |     |
| Field of study                              | Economics                                                                                                                                                                                              |                                                          |                                                                                                                                                                            |                                     |                                                                                                                      |            |     |
| Date of commencement of studies             | October 2026                                                                                                                                                                                           |                                                          | Academic year of realisation of subject                                                                                                                                    |                                     | 2026/2027                                                                                                            |            |     |
| 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                               | Full-time studies                                                                                                                                                                                      |                                                          | Mode of delivery                                                                                                                                                           |                                     | at the university                                                                                                    |            |     |
| Year of study                               | 1                                                                                                                                                                                                      |                                                          | Language of instruction                                                                                                                                                    |                                     | Polish                                                                                                               |            |     |
| Semester of study                           | 2                                                                                                                                                                                                      |                                                          | ECTS credits                                                                                                                                                               |                                     | 5.0                                                                                                                  |            |     |
| Learning profile                            | general academic profile                                                                                                                                                                               |                                                          | Assessment form                                                                                                                                                            |                                     | exam                                                                                                                 |            |     |
| Conducting unit                             | Department of Statistics and Econometrics -> Faculty of Management and Economics -> Faculties of Gdańsk University of Technology                                                                       |                                                          |                                                                                                                                                                            |                                     |                                                                                                                      |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                     |                                                          | dr inż. Agnieszka Wałachowska                                                                                                                                              |                                     |                                                                                                                      |            |     |
|                                             | Teachers                                                                                                                                                                                               |                                                          |                                                                                                                                                                            |                                     |                                                                                                                      |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                            | Lecture                                                  | Tutorial                                                                                                                                                                   | Laboratory                          | Project                                                                                                              | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                  | 30.0                                                     | 0.0                                                                                                                                                                        | 30.0                                | 0.0                                                                                                                  | 0.0        | 60  |
|                                             | 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                                                                                                                                                                                  | 60                                                       |                                                                                                                                                                            | 3.0                                 |                                                                                                                      | 62.0       | 125 |
| Subject objectives                          | preparation of students to apply statistical methods and IT tools in the analysis of mass processes and to interpret the obtained results in the context of socio-economic and business problems.      |                                                          |                                                                                                                                                                            |                                     |                                                                                                                      |            |     |
| Learning outcomes                           | Course outcome                                                                                                                                                                                         |                                                          | Subject outcome                                                                                                                                                            |                                     | Method of verification                                                                                               |            |     |
|                                             | [K6_W02] possesses advanced knowledge of methods and techniques that enable precise formulation and effective problem solving.                                                                         |                                                          | knows and understands statistical methods used to analyze mass processes and to formulate research problems and interpret results in socio-economic and business contexts. |                                     | [SW1] Assessment of factual knowledge                                                                                |            |     |
|                                             | [K6_U07] uses advanced information technologies to enhance data analysis and decision-making processes.                                                                                                |                                                          | is able to use statistical software to conduct data analysis, applying appropriate methods and formulating conclusions that support the decision-making process.           |                                     | [SU1] Assessment of task fulfilment<br>[SU4] Assessment of ability to use methods and tools                          |            |     |
|                                             | [K6_K03] is prepared to critically assess the knowledge they possess, which is necessary for solving cognitive and practical problems, and to supplement any gaps with opinions from external experts. |                                                          | is ready to critically evaluate their knowledge of descriptive statistics and identify the limitations of applied methods.                                                 |                                     | [SK5] Assessment of ability to solve problems that arise in practice                                                 |            |     |

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| Subject contents                                               | <p>Course content – lecture</p> <ol style="list-style-type: none"><li>1. Basic concepts of statistics: population, sample, and statistical variables</li><li>2. Types of statistical studies and sampling methods (random and non-random)</li><li>3. Classification of statistical characteristics and the concept of a random variable</li><li>4. Distributions of random variables as well as statistical series and histograms</li><li>5. Measures of central tendency (means, median, mode, quartiles, percentiles)</li><li>6. Measures of data variability (variance, standard deviation, range, and coefficients of variation)</li><li>7. Measures of asymmetry and kurtosis of a distribution and their interpretation</li><li>8. Visualization of statistical data (histogram, box-and-whisker plot, scatter plot)</li><li>9. Basics of statistical inference and the central limit theorem</li><li>10. Correlation analysis and relationships between variables</li><li>11. Analysis of relationships between qualitative characteristics (contingency tables, chi-square test, measures of association)</li><li>12. Introduction to regression analysis (simple and multiple regression)</li><li>13. Evaluation of statistical model quality and significance of parameters</li><li>14. Analysis of the dynamics of phenomena and time series</li><li>15. Errors in statistical research and modern methods of data visualization</li></ol> <p>Course content – laboratory</p> <ol style="list-style-type: none"><li>1. Basic concepts of statistics: population, sample, and statistical variables</li><li>2. Types of statistical studies and sampling methods (random and non-random)</li><li>3. Classification of statistical characteristics and the concept of a random variable</li><li>4. Distributions of random variables as well as statistical series and histograms</li><li>5. Measures of central tendency (means, median, mode, quartiles, percentiles)</li><li>6. Measures of data variability (variance, standard deviation, range, and coefficients of variation)</li><li>7. Measures of asymmetry and kurtosis of a distribution and their interpretation</li><li>8. Visualization of statistical data (histogram, box-and-whisker plot, scatter plot)</li><li>9. Basics of statistical inference and the central limit theorem</li><li>10. Correlation analysis and relationships between variables</li><li>11. Analysis of relationships between qualitative characteristics (contingency tables, chi-square test, measures of association)</li><li>12. Introduction to regression analysis (simple and multiple regression)</li><li>13. Evaluation of statistical model quality and significance of parameters</li><li>14. Analysis of the dynamics of phenomena and time series</li></ol> |                                                                                                                                                                                                                                                                                       |                               |
| Prerequisites and co-requisites                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                       |                               |
| Assessment methods and criteria                                | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Passing threshold                                                                                                                                                                                                                                                                     | Percentage of the final grade |
|                                                                | Problem-based test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 60.0%                                                                                                                                                                                                                                                                                 | 50.0%                         |
|                                                                | Calculation tasks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 60.0%                                                                                                                                                                                                                                                                                 | 50.0%                         |
| Recommended reading                                            | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <ol style="list-style-type: none"><li>1. Barrow, M. (2017), Statistics for Economics, Accounting and Business Studies, Harlow: Prentice Hall.</li><li>2. Newbold, P., Carlson, W.L., Thorne, B. (2019). Statistics for Business and Economics, New York: Pearson Education.</li></ol> |                               |
|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ol style="list-style-type: none"><li>1. Anderson D. (2019), Essentials Of Statistics For Business &amp; Economics, Cengage Learning</li><li>2. Bąk I.,Markiewicz I., Mojsiewicz M., Wawrzyniak K. (2021), Formulas and tables Statistical and econometric methods, CeDeWu</li></ol>  |                               |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                       |                               |
| Example issues/<br>example questions/<br>tasks being completed | <ul style="list-style-type: none"><li>• What is a statistical feature? Provide types of features and examples.</li><li>• The concept of general population and samples.</li><li>• Calculation and interpretation of basic descriptive measures of distribution.</li><li>• Knowledge of basic distributions of a random variable.</li><li>• Correlation coefficient (calculation method, interpretation).</li><li>• Assumptions of the Classical Linear Regression Model (KMRL).</li><li>• Time series components, trend analysis, measurement of seasonal fluctuations.</li><li>• Simple methods of examining the dynamics of economic phenomena, absolute growth, relative growth.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                       |                               |
| Practical activities within the subject                        | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                       |                               |

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