University of Gdańsk

Subject card

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| Subject name and code | Statistics I, PG_00178080 | | |
| Field of study | Informatics and Econometrics | | |
| Date of commencement of studies | October 2026 | Academic year of realisation of subject | 2026/2027 |
| Education level | Bachelor's studies | Subject group | Obligatory subject group in the field of study<br>Subject group related to scientific research in the field of study |
| Mode of study | full-time studies | Mode of delivery | at the university |
| Year of study | 1 | Language of instruction | Polish |
| Semester of study | 1 | ECTS credits | 7.0 |
| Learning profile | academic | Assessment form | exam |
| Conducting unit | Department of Statistics -> Faculty of Management -> Rector | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr hab. Krzysztof Najman | |
| | Teachers | | |

**Lesson types**

| Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|
| Number of study hours | 30.0 | 30.0 | 15.0 | 0.0 | 0.0 | 75 |

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 | 75 | 4.0 | 96.0 | 175 |

**Subject objectives**

The student should understand the essence of statistical methods and master statistical nomenclature fluently. Should be able to freely use selected statistical methods in solving selected social and economic problems. Possess the ability to explain the purpose of using individual methods and interpret the obtained results in relation to economic and social phenomena.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [IiEL3_W05] Knows and understands the methods, techniques and informatics or statistics tools used to acquire, collect, process and present data in decision-making processes | The student knows the theory of statistics and basic tools for statistical data analysis. | [SW4] test/exam - oral or written<br>[SW2] presentation/project/paper/ report |
| [IiEL3_U02] Can select or construct econometrics, informatics or statistics tools and apply them to describe and solve economic and social problems | The student is able to select and correctly apply statistical methods to analyze selected economic and social problems. | [SU2] presentation/project/paper/ report |
| [IiEL3_U01] Can analyze and interpret social and economic processes and phenomena using knowledge and econometrics, informatics or statistics tools from management and quality sciences, economics and finance | The student knows the practical applications of statistical methods in the analysis of socio-economic problems. | [SU2] presentation/project/paper/ report |

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| Subject contents | **Introduction to statistics: data, information, knowledge. The essence of mass phenomena, the definition of statistics, the applications of statistics. The subject, entity and functions of statistics.**<br><br>**Basic concepts of statistics**: population, sample, statistical unit, constant and variable features, measurement scales.<br>Sources of statistical data, types and stages of statistical research. The quality of statistical data.<br>Public statistics institutions in Poland and around the world. Legal aspects of statistical research in Poland.<br>**Methods of presenting statistical data**: series, tables and statistical graphs. The concept of empirical distribution, types and properties of distributions. Absolute and relative indicators.<br>**Analysis of the structure**: the concept and methods of measurement: central tendency, dispersion, asymmetry and concentration. Assumptions and principles of constructing classical and positional measures. Central and ordinary moments.<br>**Correlation analysis**: the essence, significance and areas of application of interdependence analysis. The concept of<br>stochastic dependence and correlation of quantitative phenomena. Construction and interpretation of a correlation diagram.<br>Analysis of linear interdependence of quantitative features. Essence, conditions of application and interpretation<br>of coefficients: Pearson's linear correlation, Spearman's rank correlation. Analysis of interdependence of qualitative<br>features. Construction of association and contingency tables. Essence of statistics. Principles of construction and interpretation of association and contingency coefficients. Apparent correlation.<br>**Regression analysis:** The idea of cause-and-effect relationships between various social phenomena.<br>The concept of regression of two variables. Regression functions - linear and curvilinear regression. Analytical methods<br>of determining regression function parameters. Essence of the least squares method. Evaluation of the fit of regression function to empirical data. Applications of regression analysis to the study of selected<br>social and economic phenomena. Apparent regression.<br>**Time series analysis**: essence and types of time series. The concept of dynamics of simple and complex phenomena. Measures of dynamics. Analysis of dynamics of simple phenomena: increments and indices.<br>Analysis of dynamics of complex phenomena: aggregate indices of absolute values. Averages in time series.<br>Time series decomposition: mechanical and analytical methods of trend determination. Linear and curvilinear trend functions. Assessment of trend function fit from empirical data. Extrapolation of trend, forecasting of time series and assessment of forecast quality. Applications of trend analysis in the analysis of social phenomena.<br>**Seasonality analysis**: concept and examples of seasonality in social research.<br>Seasonal fluctuations and methods of their isolation. Additive and multiplicative seasonality indicators.<br>Forecasting time series in the presence of trend and seasonal fluctuations. Assessment of forecast quality.<br>**Economic statistics**: subject and methods of economic statistics. Basic directions of research in economic statistics. Public Statistics Information System. Statistical identification and classification.<br>National Accounts System. Labor market statistics. Economic situation survey. Household budget survey.<br>Price statistics. |
| Prerequisites and co-requisites | |

Assessment methods and criteria

| Subject passing criteria | Passing threshold | Percentage of the final grade |
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| 2 written colloquium | 51.0% | 30.0% |
| written exam | 51.0% | 40.0% |
| semester project | 51.0% | 30.0% |

Recommended reading

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| Basic literature | Aczel A.D., Statystyka w zarządzaniu, PWN, Warszawa, 2000;<br>Makać W., Urbanek-Krzysztofiak D., Metody opisu statystycznego, UG, Gdańsk, 2000;<br>Ostasiewicz S., Rusnak Z., Siedlecka U., Statystyka. Elementy teorii i zadania, AE, Wrocław, 1995. |
| Supplementary literature | 1. Rosling H., Factfulness, Media Rodzina, 2018<br>2. Jóźwiak J., Podgórski J., Statystyka od podstaw, PWE, Warszawa, 2000;<br>3. Luszniewicz A, Słaby T., Statystyka stosowana, PWE, Warszawa, 1996;<br>4. Kassyk-Rokicka H. (red.), Statystyka. Zbiór zadań, PWE, Warszawa, 1999;<br>5. Sobczyk M., Statystyka. PWN, Warszawa, 2000;<br>6. Makać W., Statystyczne metody analizy bezrobocia. Krajowy Urząd Pracy, Warszawa, 1996;<br>7. Wycinka E, Szreder M. (red.), Zastosowania metod ilościowych w ubezpieczeniach, Wyd. UG; Gdańsk 2020;<br>8. Kot. S, Jakubowski J., Sokołowski A., Statystyka, Wyd. Difin, Warszawa 2011. |
| eResources addresses | |

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| Example issues/ example questions/ tasks being completed | |
| Work placement | Not applicable |

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