Descriptive and Ecomonic Statistics - course description

General information

Course name	Descriptive and Ecomonic Statistics
Course ID	11.2-WK-MATP-SOE-L-S14_pNadGenDC5H1
Faculty	Faculty of Mathematics, Computer Science and Econometrics
Field of study	Mathematics
Education profile	academic
Level of studies	First-cycle studies leading to Bachelor's degree
Beginning semester	winter term 2020/2021

Course information

Semester	4
ECTS credits to win	2
Course type	optional
Teaching language	polish
Author of syllabus	• dr Ewa Synówka

Classes forms

The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Laboratory	30	2	-	-	Credit with grade

Aim of the course

Aim of the course is to familiarize students with basics of statistical research, i.e. purposefulness of it, data mining, analysis of data, its graphical presentation and description by appropriate measures.

Prerequisites

Mathematical analysis, probability theory and economics.

Scope

1. Data structures - an introduction to chosen statistical package (e.g. R-project). (2 teaching hrs.)

2. Classification of statistical data, their grouping and depiction in tabular format. (3)

3. Graphical presentation of the given data values. Polygons of the counts. Histograms. Pie charts. Bar charts. (3)

4. Some measures of central tendency: arithmetic mean, geometric mean, harmonic mean, median, moda. Sample quantiles. Empirical cumulative distribution function. Quantile-quantile plot and box-and-whisker plot. (4)

5. Some measures of dispersion: range, variance, standard deviation and coefficient of variation. (2)

6. Measures of skewness. Sample kurtosis. (2)

7. Test. (2)

8. The Lorenz curve. The Gini coefficient. (2)

9. Correlation between two variables. Scatter diagram. The Pearson correlation coefficient. Linear regression. (3)

10. Dependence of the nominal variables. Contingency table. Some measures of association: the Pearson coefficient, the Cramer coefficient and the Yula coefficient. (3)

11. The Paasche index. The Laspeyres index. The Fisher index. (2)

12. Test. (2)

Teaching methods

Application of the statistical package (e.g. R-project) and the relevant theoretical tools to analyse the data. Students present some statistical problem in the form of a project, which contains appropriate theory and tasks to the theory.

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
A student knows and knows how to properly apply the appropriate measures to describe correlation between two variables; is able to create a raport of the chosen topic and can present it understandable.		• a project • a test • an observation and evaluation of activities during the classes	• Laboratory
A student shall know how to plan statistical survey, i.e. objective and methods of analysis; can organize the statistical data to analysis, e.g. from statistical yearbooks.		• a project • a test • an observation and evaluation of activities during the classes	• Laboratory

Outcome description	Outcome symbols	Methods of verification	The class form
A student can use the appropriate measures of the dynamics and the chosen statistical package.		• a project • a test • an observation and evaluation of activities during the classes	• Laboratory
A student knows how to present data graphically and can use the chosen statistical package to make it; how to calculate and interpret the value of the appropriate measures to describe the basic properties of the empirical distribution.		• a project • a test • an observation and evaluation of activities during the classes	• Laboratory

Assignment conditions

1. Checking students knowledge and their active participation in laboratory.

2. Tests with the tasks of different difficulty.

3. Project evaluation.

The condition of a positive grade from laboratory is to obtain of at least 50% of the maximum sum of points from the written tests and a positive grade from the report. A grade from laboratory consists of a grade from the written tests (70%) and of a grade from report (30%).

Recommended reading

1. I. Bąk, I. Markowicz, M. Mojsiewicz, K. Wawrzyniak, Statystyka w zadaniach, część I, Statystyka opisowa, WNT, 2002.

2. T. Górecki, Podstawy statystyki z przykładami w R, Wydawnictwo BTC, Legionowo 2011.

3. T. Hastie, R. Tibshirani, J. Friedman, The elements of statistical learning, Springer, 2009.

4. M. Sobczyk, Statystyka, Wydawnictwo Naukowe PWN, Warszawa 1996.

5. A. Zeliaś, Metody statystyczne, Polskie Wydawnictwo Ekonomiczne, Warszawa 2000.

Further reading

1. J. Koronacki, J. Mielniczuk, Statystyka dla studentów kierunków technicznych i przyrodniczych, WNT, Warszawa 2001.

Notes

Modified by dr Alina Szelecka (last modification: 18-09-2020 13:45)

Generated automatically from SylabUZ computer system