POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Descriptive Statistics

Course

Field of study	Year/Semester
Safety Engineering	1/1
Area of study (specialization)	Profile of study
Security and Crisis Management	general academic
Level of study	Course offered in
Second-cycle studies	Polish
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15		
Tutorials	Projects/seminars	
15		

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

Ph.D., Marian Liskowski

Mail to: marian.liskowski@put.poznan.pl

Faculty of Control, Robotics and Electrical Engineering

ul. Piotrowo 3A, 61-138 Poznań

Responsible for the course/lecturer:

Prerequisites

Knowledge of mathematics at the first-cycle studies.

Course objective

To familiarize students with the basic methods of descriptive statistics. Acquiring the ability to perform simple statistical analyzes.

Course-related learning outcomes

Knowledge

- student knows selected methods and tools of descriptive statistics that can be used in engineering practice, [P7S_WG_01, P7S_WK_03]

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- student knows the rules of preparing and conducting scientific research, is able to interpret the results of calculations and draw conclusions on the structure of the surveyed population and correlation features (phenomena), [P7S_WK_01]

Skills

- student is able to correctly select the sources and information derived from them, assess them, critically analyze and synthesize the information obtained, formulate conclusions and comprehensively justify the solutions adopted, [P7S_UW_01]

- student is able to apply methods and tools of descriptive statistics in engineering practice, [P7S_UO_01]

- student is able to apply index methods and methods of time series decomposition to dynamics analysis, [P7S_UW_04]

Social competences

- student is aware of the occurrence of cause-effect relationships relevant during the implementation of the objectives. He can rank the importance of alternative solutions, [P7S_KK_01]

- student is aware of the usefulness of mathematical competence in engineering practice, [P7S_KK_02]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:
- a test consisting of 10 questions. Passing threshold: 60% correct answers.

Tutorials:
- the ability to perform simple statistical analyzes is tested (written work). Passing threshold: 55% of the points limit,
- verification of skills during classes.

Programme content

Preliminaries (populations, observations and samples, statistical characteristics and their classification, measure scales). Statistical research stages (aim, subject and space of statistical research, statistical observations and samples, statistical series and their types, statistical tables, graphical presentation of observation results). Numerical characteristics of the structure: measures of central tendency, measures of dispersion, measures of skewness, measures of concentrations. Measures of correlation for two variables (correlation series, correlation diagram, correlation table, covariance, Pearson's correlation coefficient, Spearman's rank correlation coefficients). Regression analysis (linear regression model). Analysis of growth dynamics (time series, absolute increase, relative increase, fixed base index, chain index, aggregative index). Decomposition of the time series: trend, seasonality and cycles, random fluctuations. Estimate of degree of adjusting of linear trend model for empirical data. Prediction based on linear regression model (absolute and relative prediction error).

Teaching methods

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Lecture:

 lecture conducted in an interactive way with the formulation of questions to students.

Tutorials:

- solving example tasks on the board,
- detailed review of task solutions,
- initiate discussion on solutions.

Bibliography

Basic

1. Roeske-Słomka I. (2016), Statystyka opisowa , Wyd. Uniwersytet Ekonomiczny w Poznaniu

2. Starzyńska W. (2017), Statystyka praktyczna, PWN, Warszawa.

3. Wasilewska E. (2009), Statystyka opisowa od podstaw. Podręcznik z zadaniami, Wydawnictwo SGGW, Warszawa.

4. Wierzbiński J (2006), Statystyka opisowa, www.wz.uw.edu.pl › Statystyka_opisowa_

Additional

1. M. Sobczyk, Statystyka opisowa, Wydawnictwo C.H. Beck, Warszawa 2010

2. M. Iwińska, B. Popowska, M. Szymkowiak, Statystyka opisowa, Wydawnictwo Politechniki Poznańskiej, Poznań, 2011

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for tutorials, preparation for tests) [1]	70	3,0

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[1] delete or add other activities as appropriate