



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Descriptive and elements of applied statistics

### Course

Field of study

Engineering Management

Year/Semester

3/5

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

### Number of hours

Lecture

10

Laboratory classes

Other (e.g. online)

Tutorials

16

Projects/seminars

### Number of credit points

4

### Lecturers

Responsible for the course/lecturer:

dr Marian Liskowski

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Engineering

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Responsible for the course/lecturer:

### Prerequisites

Knowledge of mathematics defined by the core curriculum of mathematics education of secondary school.

### 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 methods and tools of descriptive statistics and their application for modeling processes and phenomena occurring in organizations.



### Skills

- student is able to use methods and tools of descriptive statistics and acquire data to analyze specific processes and economic phenomena in the field of management,
- student is able to build linear regression models of economic phenomena and make forecasts,
- student is able to apply index methods and methods of time series decomposition to dynamics analysis,
- student has the ability to prepare a written report in Polish from a statistical survey.

### 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,
- student is aware of the usefulness of mathematical competence in engineering practice.

### 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

#### 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](http://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	26	1,5
Student's own work (literature studies, preparation for tutorials, preparation for tests/exam <sup>1</sup> )	74	3,0

<sup>1</sup> delete or add other activities as appropriate