STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Descriptive statistics**	Code **1011101321010341935**

Field of study	Profile of study (general academic, practical)	Year /Semester
Engineering Management - Full-time studies -	**general academic**	**1 / 2**

Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
First-cycle studies	**full-time**

No. of hours				No. of credits
Lecture: **30** Classes: **15** Laboratory: **-** Project/seminars: **-**				**4**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
other	**university-wide**

Education areas and fields of science and art	ECTS distribution (number and %**)**
technical sciences	**2 50%**
social sciences	**2 50%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of elementary functions, algebraic operations, mathematical analysis and probability theory.
2	**Skills**	Computer skills: MS Office environment knowledge (especially MS Excel). Ability of using calculators.
3	**Social competencies**	Students seriously treat the process of studying.

Assumptions and objectives of the course:

Descriptive statistics are used to describe the basic features of the data in a study. They provide simple summaries about the sample and the measures. Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Students understand the meaning of descriptive statistics and their applications in other sciences. - [K1A_W12]

2. Students know how to use descriptive statistics methods in a making analysis of the data. - [K1A_W12]

3. Students know about calculating and programming techniques involved in descriptive statistics methods and understand their boundaries. - [K1A_W12]

Skills:

1. Student is able to interpret the information from a sample and to draw conclusions.   - [K1A_U02, K1A_U03, K1A_U04]

Social competencies:

1. Student understands the necessity of continuous learning .   - [K1A_K01]

Assessment methods of study outcomes

Lectures:

Written final test.

Tutorials:

Two written tests (on 7th and 14th weeks).

Course description

APPLIED METHODS OF TEACHING: lectures - a slide show with examples written on the blackboard; tutorials - discussion on solved problems.

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, graphs - histograms, boxplot, box-and-whisker plot).

MEASURES OF CENTRAL TENDENCY (outliers, arithmetic mean (AM), geometric mean (GM), harmonic mean (HM), relationship between AM, GM and HM, mode, median, quartiles, other quantiles).

MEASURES OF DISPERSION (average deviation, variance, standard deviation, classic coefficient of variation, range, interquartile range, interquartile deviation, order coefficient of variation).

MEASURES OF SKEWNESS (negative skew, positive skew, measures of skewness, coefficient of asymmetry, order measure of skewness, order measure of asymmetry, central moments of third order, sample skewness).

MEASURES OF CONCENTRATIONS (kurtosis,excess, Gini coefficient of concentration, Lorenz curve).

MEASURES OF CORRELATION FOR TWO VARIABLES (correlation series, correlation diagram, correlation table, covariance, Pearson's correlation coefficient, Spearman's and Kendall's rank correlation coefficients).

REGRESSION ANALYSIS (linear regression model, least squares method, nonlinear regression, multiple regression).

UPDATE: 2016/2017

Basic bibliography:

1. E. Wasilewska, Statystyka opisowa od podstaw. Podręcznik z zadaniami, Wydawnictwo SGGW, Warszawa 2009.

2. F. Wysocki, J. Lira, Statystyka opisowa, Wydawnictwo Akademii Rolniczej w Poznaniu, Poznań 2007.

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

Additional bibliography:

1. J. M. Kowalski, Podstawy statystyki opisowej dla ekonomistów, Wydawnictwo WSB, Poznań-Chorzów 2006.

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

Result of average student's workload

Activity	Time (working hours)
1. Lectures (15x2h).	30
2. Tutorials (15h)	15
3. Homeworks preparing for next tutorials.	7
4. Homeworks preparing for the final test on the last lecture	15
5. Homeworks preparing for the tests on tutorials	15
6. Final written test on the last lecture	4
7. Final written test on the last tutorial	4
8. Meetings with the lecturer.	7

Student's workload

Source of workload	hours	ECTS
Total workload	97	4
Contact hours	60	2
Practical activities	37	2