

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Descriptive statistics</b>		Code <b>1010341641010348915</b>
Field of study <b>Mathematics</b>	Profile of study (general academic, practical) <b>general academic</b>	Year /Semester <b>2 / 4</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>30</b> Classes: <b>-</b> Laboratory: <b>30</b> Project/seminars: <b>-</b>		No. of credits <b>3</b>
Status of the course in the study program (Basic, major, other) <b>basic</b>		(university-wide, from another field) <b>university-wide</b>
Education areas and fields of science and art <b>the sciences</b>		ECTS distribution (number and %) <b>3 100%</b>
<b>Responsible for subject / lecturer:</b> dr Alina Gleska email: alina.gleska@put.poznan.pl tel. 61 665 2330 Faculty of Electrical Engineering ul. Piotrowo 3A 60-965 Poznań		<b>Responsible for subject / lecturer:</b> dr Agnieszka Ziemkowska email: agnieszka.ziemkowska@put.poznan.pl tel. 61 665 2812 Faculty of Electrical Engineering ul. Piotrowo 3A 60-965 Poznań
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Basic knowledge of elementary functions, algebraic operations, mathematical analysis and probability theory.
2	<b>Skills</b>	Computer skills: MS Office environment knowledge (especially MS Excel).
3	<b>Social competencies</b>	Students seriously treat the process of studying.
<b>Assumptions and objectives of the course:</b> 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.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Students understand the meaning of descriptive statistics and their applications in other sciences. - [K_W02] 2. Students know how to use descriptive statistics methods in a making of analysis the data. - [K_W09] 3. Students know about calculating and programming techniques involved in descriptive statistics methods and understand their boundary. - [K_W05, K_W06]		
<b>Skills:</b>		
1. Students are able to formulate the aim, the subject and the range of the statistics. - [K_U15, K_U16, K_U17] 2. Students are able to present the results of the research. - [K_U15, K_U16, K_U17] 3. Students are able to use the proper statistical methods in order to make the analysis of the data. - [K_U15, K_U16, K_U17] 4. Students are able to make the quantitative analysis and to formulate the proper corollaries about studied phenomena. - [K_U05] 5. Students are able to learn by themselves. - [K_U30]		
<b>Social competencies:</b>		
1. Students understand the need of the further education and the developing of their skills. - [K_K01, K_K05] 2. Students are able to define the priorities properly. - [K_K03] 3. Students understand the social aspects of the practical using of the knowledge and the connected with them responsibility. - [K_K03, K_K04] 4. Students are able to act in the enterprising way. - [K_K03]		

<b>Assessment methods of study outcomes</b>		
Lectures: Written final test.  Laboratories: Short tests on every laboratories. Final test on the last laboratory.		
<b>Course description</b>		
APPLIED METHODS OF TEACHING: lectures - a slide show with examples written on the blackboard; laboratory - discussion on solved problems (using eg. free software). 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		
<b>Basic bibliography:</b>		
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.		
<b>Additional bibliography:</b>		
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.		
<b>Result of average student's workload</b>		
Activity	Time (working hours)	
1. Lectures (15x2h).	30	
2. Laboratories (15x2h).	30	
3. Homeworks preparing for short tests on laboratories.	15	
4. Homeworks preparing for the next laboratories.	7	
5. Homeworks preparing for the exam.	10	
6. Short final test on laboratory.	4	
7. Written final exam.	4	
8. Meetings with the lecturer.	4	
<b>Student's workload</b>		
Source of workload	hours	ECTS
Total workload	104	3
Contact hours	72	2
Practical activities	52	1