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 and elements of applied statistics

Course

Field of study	Year/Semester
Engineering Management	3/5
Area of study (specialization)	Profile of study
	general academic
Level of study	Course offered in
First-cycle studies	Polish
Form of study	Requirements
part-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
10		
Tutorials	Projects/seminars	
16		

Number of credit points

4

Lecturers

Responsible for the course/lecturer:	Responsible for the course/lecturer:
Ph.D., Alina Gleska	
Mail to: alina.gleska@put.poznan.pl	
Faculty of Automatic Control, Robotics and Electrical Engineering	
ul. Piotrowo 3A, 60-965 Poznań	

Prerequisites

Basic knowledge of elementary functions, algebraic operations, mathematical analysis and probability theory .

Course objective

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.

Course-related learning outcomes

Knowledge

POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

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

1. The student knows the methods and tools of descriptive statistics and their application to modeling processes and phenomena occurring in organizations [P6S_WG_09]

2. The student knows the appropriate computational techniques and programming, supporting the methods of descriptive statistics, and understands their limitations [P6S_WG_08]

3. The student has knowledge about the importance of statistics as science and its relationships with other fields of knowledge [P6S_WG_01]

Skills

1. The student is able to use the basic theoretical knowledge and obtain data to analyze specific processes and social phenomena (cultural, political, legal, economic) in the field of management [P6S_UW_01]

2. The student is able to plan and carry out experiments, including computer measurements and simulations, interpret the results obtained and draw conclusions [P6S_UW_09]

3. Student is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks [P6S_UW_10]

Social competences

1. The student understands the need for further education and development of acquired skills [P6S_KK_01]

2. The student is able to properly set priorities for the implementation of the task specified by himself or other [P6S_KK_02]

3. The student understands the social aspects of the practical application of acquired knowledge and the associated responsibility [P6S_KR_02]

4. The student is able to act in an entrepreneurial manner [P6S_KO_03]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lectures: written final test on the last lecture;

Tutorials: one test on the last meeting.

Programme content

Update: 01.09.2021r.

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).

POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

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

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, central moments of third order, sample skewness).

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

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

Teaching methods

Lectures:

• theory presented in relation to the current knowledge of students;

• frequent initiating discussions during the lecture;

• recommending materials for self-expanding knowledge.

Tutorials:

• tasks closely related to the theory presented during the lecture;

• detailed discussion of solved tasks.

Bibliography

Basic

1. G.A.F. Seber, A. J. Lee, Linear regression analysis. John Wiley and Sons, 2003 (Mg 179960)

2. R. Johnson, Elementary statistics. Boston: Duxbury Press, 1984 (Mg 190139)

3. E. Wasilewska, Statystyka opisowa od podstaw. Podręcznik z zadaniami. Wydawnictwo SGGW, 2015.

4. E. Wasilewska, Statystyka matematyczna w praktyce. Wydawnictwo Difin, 2015. (księg. stud. E1, W 157580)

5. I. Bąk, I. Markowicz, M. Mojsiewicz, K. Wawrzyniak, Statystyka opisowa : przykłady i zadania. Wydawnictwo: CeDeWu, Warszawa 2015. (księg. stud. A2, W 157584)

6. W. Starzyńska, Statystyka praktyczna. Wydawnictwo Naukowe PWN, Warszawa 2012. (księg. stud. A2, W 146547)

POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

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

7. M. Iwińska, B. Popowska, M. Szymkowiak, Statystyka opisowa. Wydawnictwo Politechniki Poznańskiej, 2011. (księg. stud. E1, W 130794)

8. J. Buga, H. Kassyk-Rokicka, Podstawy statystyki opisowej. Wydawnictwo: Vizja Press & IT, Warszawa 2008. (księg. stud. A2, W 119664)

9. M. Sobczyk, Statystyka. Wydawnictwo Naukowe PWN, Warszawa (1998 – księg. stud. A2, W 146934; 2007 - czytelnia)

Additional

1. A. Witkowska, M. Witkowski, Statystyka opisowa w przykładach i zadaniach. Wydawnictwo Uczelni Państwowej Wyższej Szkoły Zawodowej im. Prezydenta Wojciechowskiego, Kalisz 2007. (księg. stud. A2, W 123957)

2. W. Regel, Ćwiczenia z podstaw statystyki w Excelu. Wydawnictwo Naukowe PWN, Warszawa 2007. (księg. stud. A2, W 121127)

3. A. Aczel, Statystyka w zarządzaniu : pełny wykład (przekł.: Zbigniew Czerwiński, Wojciech Latusek). Wydawnictwo Naukowe PWN, Warszawa 2006. (księg. stud. A3, W 90872)

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 test and final written test)[1]	70	3,0

[1] delete or add other activities as appropriate