

FACULTY OF ELECTRICAL  
ENGINEERING**SUBJECT CARD**

Name in Polish: **Statystyka stosowana**  
 Name in English: **Applied Statistics**  
 Main field of study (if applicable): **Electrical Engineering**  
 Specialization (if applicable):  
 Level and form of studies: **1st level, part-time**  
 Kind of subject: **obligatory / university-wide**  
 Subject code: **MAT001503**  
 Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):	20				
Number of hours of total student workload (CNPS):	81				
Form of crediting:	crediting with grade				
For group of courses mark (X) final course:					
Number of ECTS points:	3				
including number of ECTS points for practical (P) classes :					
including number of ECTS points for direct teacher-student contact (BK) classes:	2.10				

**PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES**

1. He is familiar with the basic concepts of mathematical analysis and knows how to apply them.
2. He knows the elementary probability at the high school level.

**SUBJECT OBJECTIVES**

- C1. Understanding the basic concepts of probability and its applications in mathematical modeling.  
 C2. Acquiring skills in applying basic methods of descriptive and graphical analysis of empirical data.  
 C3. Acquisition of skills in building statistical model and formulating its assumptions.  
 C4. Acquisition of skills in choosing procedures and algorithms needed in statistical inference

**SUBJECT EDUCATIONAL EFFECTS***relating to knowledge:*

- PEK\_W01 Has a basic knowledge of modeling random phenomena and application of probabilistic models.  
 PEK\_W02 Knows basic descriptive statistics and algorithms for their determination.  
 PEK\_W03 Knows methods of estimation used in the basic parametric and nonparametric models, is familiar with significance tests for the parameters of random variables and knows basic non-parametric tests, knows how to analyze the dependence structures between quantitative variables.

*relating to skills:**relating to social competences:*

- PEK\_K01 can search for necessary information in the literature and to acquire knowledge independently.

PROGRAMME CONTENT		
Form of classes - lecture		Number of hours:
Lec 1	Probability space. The axiomatic definition of probability.	2
Lec 2	Conditional probability. Independence of events.	2
Lec 3	Random variables. Discrete random variables. Parameters of discrete random variables. Binomial and Poisson distributions.	2
Lec 4	Continuous random variables. Parameters of continuous random variables. Uniform, normal and exponential distributions.	2
Lec 5	Standardization of a random variable. Tables of the standard normal, chi-square and t-Student distributions. Independence of random variables. Two-dimensional random variables. The correlation coefficient.	2
Lec 6	Basic statistical ideas and notions. Point estimation. Unbiasedness and consistency of estimators.	2
Lec 7	Confidence intervals. Testing statistical hypotheses. Basic ideas.	2
Lec 8	Parametric tests.	2
Lec 9	Nonparametric tests. Chi-square goodness of fit test and chi-square test for independence.	2
Lec 10	Simple linear regression. Calculation of a regression line (the method of least-squares).	2
Total hours:		<b>20</b>

TEACHING TOOLS USED
N1. Lecture - traditional method. N2. Problems list. N3. Consultation hours. N4. Student's self preparation - solving of problems and test.

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT		
Evaluation <i>F - forming (during semester)</i> <i>P - concluding (at semester end)</i>	Educational effect number	Way of evaluating educational effect achievement
F1(w)	PEK_W01 PEK_W02 PEK_W03 PEK_K01	Test
P(w)	P=F1	

PRIMARY AND SECONDARY LITERATURE
<b>PRIMARY LITERATURE:</b> [1] J. Koronacki, J. Mielniczuk, Statystyka dla studentów kierunków technicznych i przyrodniczych, WNT, Warszawa 2004. [2] L. Gajek, M. Kałuska, Wnioskowanie statystyczne. Modele i metody. WNT, Warszawa 2004. [3] J. Greń, Statystyka matematyczna. Modele i zadania, PWN, Warszawa 1976. [4] H. Jasiulewicz, W. Kordecki, Rachunek prawdopodobieństwa i statystyka matematyczna. Przykłady i zadania. GiS, Wrocław 2001. [5] W. Krywicki, J. Bartos, W. Dyczka, K. Królikowska, M. Wasilewski, Rachunek prawdopodobieństwa i statystyka matematyczna w zadaniach, Cz. I-II, PWN, Warszawa 2007.
<b>SECONDARY LITERATURE:</b> T. Inglot, T. Ledwina, Z. Ławniczak, Materiały do ćwiczeń z rachunku prawdopodobieństwa i statystyki matematycznej, Wydawnictwo Politechniki Wrocławskiej, Wrocław 1984. [2] W. Klonecki, Statystyka matematyczna, PWN, Warszawa 1999. [3] W. Kordecki, Rachunek prawdopodobieństwa i statystyka matematyczna. Definicje, twierdzenia, wzory, Oficyna Wydawnicza GiS, Wrocław 2002. [4] A. Plucińska, E. Pluciński, Zadania z probabilistyki, PWN, Warszawa 1983. [5] A. Stanisław, Przystępny kurs statystyki, Kraków 1998.

SUBJECT SUPERVISOR
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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT  
**MAT001503 - Applied Statistics**  
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY **Electrical Engineering**

Subject educational effect	Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)	Subject objectives	Programme content	Teaching tool number
PEK_W01	K1ETK_W06	C.1	Lec1 Lec2 Lec3 Lec4	N.1 N.2 N.3 N.4
PEK_W02	K1ETK_W06	C.2 C.3	Lec5	N.1 N.2 N.3 N.4
PEK_W03	K1ETK_W06	C.2 C.3 C.4	Lec6 Lec7 Lec8 Lec9 Lec10	N.1 N.2 N.3 N.4
PEK_K01	K1ETK_K04	C.1 C.2 C.3 C.4	Lec1 Lec2 Lec3 Lec4 Lec5 Lec6 Lec7 Lec8 Lec9 Lec10	N.1 N.2 N.3 N.4