

**WROCLAW UNIVERSITY OF TECHNOLOGY – PHD STUDIES**

<b>FACULTY OF PURE AND APPLIED MATHEMATICS</b>
<b>SUBJECT CARD</b>
Course name in Polish: Wstęp do Statystyki Praktycznej
Course name in English: Introduction to the Practice of Statistics
Course language: English
University-wide general course type: 1) <u>basic course (mathematics, physics, chemistry, other)</u> 2) humanity course 3) managerial skills 4) English language 5) other modern language Departmental course developing professional skills: 1) specialized course 2) interdisciplinary course 3) seminar (interdisciplinary, specialized, departmental)
Type of course (obligatory, <u>optional</u> )
<b>Educational effects according to ZW 26/2017 regulations:  P8S_WG, P8S_UW, P8S_KK, P8S_KR</b>
Subject code: MAT1308

\*delete as applicable

	Lecture
Number of hours of organized classes in University (ZZU)	30
Number of hours of total student workload (CNPS)	90
Form of crediting	Exam
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

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

1. Student has basic knowledge and skills in Calculus and Probability
2. Student is able to search for supplementary material in various areas of knowledge.
3. Student has good English communication skills.

**SUBJECT OBJECTIVES**

C1	Student will acquire basic skills of descriptive and graphical statistics for empirical data
C2	Student will learn basic notions of probability used in mathematical modelling.
C3	Student will learn how to form statistical models with specific assumptions.
C4	Student will learn how to choose and perform statistical procedures in specific statistical problems.

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**SUBJECT EDUCATIONAL EFFECTS****Relating to knowledge:**

PEK\_W01 – Student knows basic methods of graphical and descriptive presentation of data

PEK\_W02 – Student knows basic probabilistic models

PEK\_W03 – Student knows methods of estimation in basic parametric models

PEK\_W04 – Student knows tests of significance for a selection of parametric models

**Relating to skills:**

PEK\_U01 – Student can apply graphical and descriptive methods to present data

PEK\_U02 – Student can perform calculations related to basic parametric probability models

PEK\_U03 – Student can perform estimation in basic parametric models

PEK\_U04 – Student can choose and perform tests of significance in basic parametric models

**Relating to social competences:**

PEK\_K01 – Student is aware of the role of cooperation, including an international cooperation.

PEK\_K02 – Student is aware of the importance of the original research activity

**PROGRAM CONTENTS**

<b>Form of classes – lecture</b>		<b>Number of hours</b>
Lec 1	Data and distribution. Describing distribution with graphs and numbers.	2
Lec 2	Normal distribution.	2
Lec 3	Relationships in data. Scatterplot and correlation. Least-squares regression.	2
Lec 4	The question of causation. Design of experiment and sampling design.	2
Lec5	Rules of probability. Independence.	2
Lec6	Sampling distributions of counts and means.	2
Lec7	Introduction to confidence intervals.	2
Lec8	Midterm 1.	2
Lec9	Introduction to tests of significance.	2
Lec10	T-tests and T-confidence intervals for means.	2
Lec11	Inference for proportions.	2
Lec12	Two-way tables. Conditional distributions. Testing for independence in two-way tables.	2
Lec13	Inference for simple linear regression.	2
Lec14	One-way analysis of variance.	2
Lec15	Midterm 2.	2
	Total hours	30

**TEACHING TOOLS USED**

N1	lecture
N2	consultation
N3	homework: solving problems and exercises

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<b>EVALUATION OF ACHIEVED SUBJECT EDUCATIONAL EFFECTS</b>		
<b>Evaluation:</b> F – forming (partial) C – concluding	Educational effect number	Way of evaluating achievement of educational effects
F1	PEK_U01, PEK_U02, PEK_U03, PEK_U04, PEK_W01, PEK_W02, PEK_W03, PEK_W04	midterm 1
F2	PEK_U01, PEK_U02, PEK_U03, PEK_U04, PEK_W01, PEK_W02, PEK_W03, PEK_W04	midterm 1
F3	PEK_U01, PEK_U02, PEK_U03, PEK_U04, PEK_W01, PEK_W02, PEK_W03, PEK_W04	homework
F4	PEK_U01, PEK_U02, PEK_U03, PEK_U04, PEK_W01, PEK_W02, PEK_W03, PEK_W04	quizzes
<b>C = 0.25*F1 + 0.25*F2 + 0.25*F3 + 0.25*F4</b>		

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## PRIMARY AND SECONDARY LITERATURE

**PRIMARY LITERATURE:**

[1] D. Moore, G. McCabe, Introduction to the Practice of Statistics, ed. IV, Freeman, 2003.

**SECONDARY LITERATURE:**

- [1] L. Gajek, M. Kałużka, Wnioskowanie statystyczne. Modele i metody. WNT, Warszawa 2004.  
 [2] J. Greń, Statystyka matematyczna. Modele i zadania, PWN, Warszawa 1976.  
 [3] T. Inglot, T. Ledwina, Z. Ławniczak, Materiały do ćwiczeń z rachunku prawdopodobieństwa i statystyki matematycznej, Wydawnictwo Politechniki Wrocławskiej, Wrocław 1984.  
 [4] H. Jasiulewicz, W. Kordecki, Rachunek prawdopodobieństwa i statystyka matematyczna. Przykłady i zadania. GiS, Wrocław 2001.  
 [5] W. Klonecki, Statystyka matematyczna, PWN, Warszawa 1999.  
 [6] J. Koronacki, J. Mielniczuk, Statystyka dla studentów kierunków technicznych i przyrodniczych, WNT, Warszawa 2004.  
 [7] W. Kryszicki, J. Bartos, W. Dyczka, K. Królikowska, M. Wasilewski, Rachunek prawdopodobieństwa i statystyka matematyczna w zadaniach, Cz. I-II, PWN, Warszawa 2007.  
 [8] W. Kordecki, Rachunek prawdopodobieństwa i statystyka matematyczna. Definicje, twierdzenia, wzory, Oficyna Wydawnicza GiS, Wrocław 2002.

**SUBJECT SUPERVISOR**

(NAME AND SURNAME, E-MAIL ADDRESS)

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**MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS  
 FOR SUBJECT  
 INTRODUCTION TO THE PRACTICE OF STATISTICS  
 AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY  
 Doctoral studies at Faculty of Pure and Applied Mathematics**

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 (knowledge)	P8S_WG	C1	Lec1-4	N1, N2, N3
PEK_W02	P8S_WG	C2	Lec5-6	N1, N2, N3
PEK_W03	P8S_WG	C3, C4	Lec7-15	N1, N2, N3
PEK_W04	P8S_WG	C3, C4	Lec7-15	N1, N2, N3
PEK_U01 (skills)	P8S_UW	C2	Lec1-4	N1, N2, N3
PEK_U02	P8S_UW	C2, C3	Lec5-6	N1, N2, N3

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<b>PEK_U03</b>	<b>P8S_UW</b>	C3, C4	Lec7-15	N1, N2, N3
<b>PEK_U04</b>	<b>P8S_UW</b>	C3, C4	Lec7-15	N1, N2, N3
<b>PEK_K01</b> (competence s)	<b>P8S_KK</b>	C1, C2, C3, C4	Lec1-15	N1, N2
<b>PEK_K02</b>	<b>P8S_KR</b>	C1, C2, C3, C4	Lec1-15	N1, N2

\*\* - enter symbols for main-field-of-study/specialization educational effects

\*\*\* - from table above