WROCŁAW UNIVERSITY OF TECHNOLOGY – PHD STUDIES

FACULTY OF Fundamental Problems of Technology **SUBJECT CARD**
Course name in Polish **Statystyka w Naukach Biomedycznych**
Course name in English **Statistics in Biomedical Sciences**
Course language **English**
University-wide general course type: 1)basic course (mathematics, physics, chemistry, other) 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, optional)
Educational effects according to ZW 26/2017: P8U_W, P8S_WG, P8U_U, P8S_UW, P8_UK, P8S_KK
Subject code **FTP9008**

*delete as applicable

	Lecture	Laboratory	Seminar
Number of hours of organized classes in University (ZZU)	30		
Number of hours of total student workload (CNPS)	60		
Form of crediting	Exam **	Exam / crediting with grade*	Oral presentation
Number of ECTS points	2		
including number of ECTS points for practical (P) classes			
including number of ECTS points for direct teacher-student contact (BK) classes			

*delete as applicable **In case of didactic courses also inspections and evaluation classes

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knowledge of English Language
2. Knowledge of Fundamentals of Probability and Statistics

SUBJECT OBJECTIVES	
C1	Acquisition of knowledge of statistical methods in biomedicine
C2	Acquisition of skills in the implementation of advanced numerical algorithms and their use for statistical analysis.

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SUBJECT EDUCATIONAL EFFECTS

Related to knowledge:

PEK_W01 Knows and understands the mechanism behind selected series of statistical procedures

PEK_W02 Knows and understands the advantages, disadvantages and limitations of the selected series of statistical procedures

PEK_W03 Has the knowledge in application of statistical tools in biomedical sciences

Related to skills:

PEK_U01 Can extract basic information about statistical methods from literature, databases and other sources

PEK_U02 Can question the results and draw conclusions about statistical methods

PEK_U03 Can use information techniques to implement statistical methods

Related to social competence:

PEK_K01 Is aware of responsibility for his/her own work

PEK_K02 Demonstrates willingness to comply with the rules of teamwork

PEK_K03 Knows his/her own limitations and understands the need for further education

PROGRAM CONTENTS		
Form of classes – lecture		Number of hours
Lec 1	*Introduction, random variable, probability distribution*	2
Lec 2	*Function of random variable, expected value, correlation function*	2
Lec 3	*Least squares method*	2
Lec 4	*Maximum likelihood method*	2
Lec 5	*Fundamentals of correlation and regression*	2
Lec 6	*Linear and nonlinear models*	2
Lec 7	*Bland-Altman method*	2
Lec 8	*Hypothesis testing, normality test, Student t-test*	2
Lec 9	*Nonparametric hypothesis testing*	2
Lec10	*Detection and classification, ROC curves*	2
Lec11	*ANOVA 1*	2
Lec12	*ANOVA 2 and ANOVA N*	2
Lec13	*Discriminative multivariate analysis*	2
Lec14	*Method of K-means*	2
Lec15	*Bootstrap*	2
	Total hours	**30**

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TEACHING TOOLS USED	
N1	lecture with traditional delivery tools
N2	Elements of multimedia presentation illustrating the issues discussed during the lecture

EVALUATION OF ACHIEVED SUBJECT EDUCATIONAL EFFECTS		
Evaluation: F – forming (partial) C – concluding	Educational effect number	Way of evaluating achievement of educational effects
F1	P8U_W, P8S_WG, P8U_U, P8S_UW, P8_UK, P8S_KK	1. Short written work - reports in teams 2. Final assignment in the field of biomedical data analysis

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] H. Riffenburgh. Statistics in Medicine, Elsevier Academic Press, 2006

SECONDARY LITERATURE:

[1] W. L. Martinez, Computational Statistics Handbook with MATLAB, Chapman & Hall/CRC Computer Science & Data Analysis

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)
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