

FACULTY OF CHEMISTRY

SUBJECT CARD**Name of subject in Polish** Planowanie eksperymentów w Statistica**Name of subject in English** Planning experiments in Statistica**Main field of study (if applicable):** Chemical Engineering and Technology**Specialization (if applicable):****Profile:** academic**Level and form of studies:** 2nd level, full-time**Kind of subject:** optional**Subject code** W03CET-SM2101C**Group of courses** NO

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)		30			
Number of hours of total student workload (CNPS)		50			
Form of crediting (Examination / crediting with grade)		crediting with grade			
For group of courses mark (X) final course					
Number of ECTS points		2			
including number of ECTS points for practical classes (P)		2			
including number of ECTS points corresponding to classes that require direct participation of lecturers and other academics (BU)		1,2			

*delete as not necessary

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basics of probability theory: the concept of probability and its properties, independence of random events
2. Basic knowledge of mathematical analysis and linear algebra

SUBJECT OBJECTIVES

- C1 Getting to know the Statistica environment
- C2 Learning about selected experiment planning techniques.
- C3 Acquiring the ability to select an appropriate statistical test to analyze the results
- C4 Acquiring the ability to use linear and non-linear regression in the analysis of results
- C5 Acquiring the ability to use the selected Statistica package in planning the experiment and analyzing the results

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

Person who passed the subject:

PEU_W01 – Has knowledge in the field of statistics

PEU_W02 – Has knowledge in planning research using experimental methods used in biotechnology

relating to skills:

Person who passed the subject:

PEU_U01 – Can operate Statistica software

PEU_U02 – Is able to create an experiment diagram with a work schedule

PEU_U03 – Is able to perform basic statistical analyzes and correctly interprets the obtained results

relating to social competences:

Person who passed the subject:

PEU_K01 – Is ready to critically evaluate their knowledge

PEU_K02 – Is aware of the importance of acquired theoretical and practical knowledge and is ready to apply general and engineering skills in practice

PEU_K03 – Has the ability to work in a team of several people

PROGRAMME CONTENT

Classes		Number of hours
C1	Introduction to Statistica. Sample, types of data, data presentation	2
C2	Variable distributions (normal, normality test, binomial distribution, Poisson)	2
C3	Correlations, Anova	2
C4	Sets of variables, group analysis	2
C5	Data management. Worksheet formulas and multivariable transformation. Importing from Excel. Data preparation (cleaning and flirting)	2
C6	Characteristics of the purpose and object of research	2
C7	Optimal research plans. Selection based on the specific purpose and object of research	2
C8	Complete plans.	2
C9	Two-value complete or fractional plans. Bivalent elimination plans	2
C10	Plans with three-valued input quantities. Plans in which some factors are bivalent and some are trivalent	2
C11	Compositional master plans	2
C12	Statistical analysis of results 1	2
C13	Statistical analysis of results 2	2
C14	Practical use of results	2
C15	Collquium	2
	Total hours	30

TEACHING TOOLS USED

N1. Multimedia presentation.
 N2. Lab.
 N3. Description of results using computer graphics programs.
 N4. Consultations.

EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT

Evaluation (F – forming during semester), P – concluding (at semester end)	Learning outcomes code	Way of evaluating learning outcomes achievement
F1	PEU_W01-W02	Colloquium
F2	PEU_U01-U03 PEU_K01-K03	Preparation of a computational project
P = (F1+F2)/2		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

- [1] Joaquim P. Marques de Sá., Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer Berlin, Heidelberg, 2007
 [2] Lindsey, J.K., Introduction to Applied Statistics. Oxford University Press, 2003

SECONDARY LITERATURE:

- [1] Statistica: przewodnik. StatSoft, Kraków, 2011
 [2] T. Greber, Statystyczne sterowanie procesami - doskonalenie jakości z pakietem STATISTICA, Kraków, 2000
 [3] B. Kacprzyński, Planowanie eksperymentów : podstawy matematyczne, Wydawnictwa Naukowo-Techniczne, 1974

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

KONRAD MATYJA, konrad.matyja@pwr.edu.pl