

FACULTY OF CHEMISTRY						
SUBJECT CARD						
Name of subject in Polish	Analiza statystyczna danych eksperymentalnych					
Name of subject in English	Statistical analysis of experimental data					
Main field of study (if applicable):	Chemical and process engineering					
Specialization (if applicable):	Advanced Chemical Engineering and Nanotechnology					
Profile:	academic					
Level and form of studies:	2nd level, full-time					
Kind of subject:	obligatory					
Subject code	MAC024022					
Group of courses	NO					
	Lecture	Classes	Laboratory	Project	Seminar	
Number of hours of organized classes in University (ZZU)	15					
Number of hours of total student workload (CNPS)	60					
Form of crediting	crediting with grade					
For group of courses mark (X) final course						
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	0,5					
PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES						
1. Basics of theory of probability. 2. Basics of calculus. 3. Good knowledge of international system of units (SI).						
SUBJECT OBJECTIVES						
C1 . Quantitative estimation of quality of a direct measurement. C2 . Quantitative estimation of evaluation quality for an direct value. C3. Understanding of quality of statistical description of experimental data. C4 . Understanding of basic ideas of statistical comparisons of measurements. C5. Analysis of degree of correlation between variables. C6. Statistical adjustment of experimental curves.						
SUBJECT EDUCATIONAL EFFECTS						
Relating to knowledge:						
After the classes, a student knows:						
PEK_W01 – what are the types, sources, and methods of determination of experimental uncertainties;						
PEK_W02 – how to choose and calculate meaningful means, and evaluate the limits of dispersion of experimental results,						
PEK_W03 – what is the relations between correlation and regression analysis of data,						
PEK_W04 – what are the common principle of statistical tests,						
PEK_W04 – how to choose and run tests of comparison of two or more experimental values,						
PEK_W05 – how to choose and run simple non-parametric tests,						
PEK_W06 – how to estimate the parameters of regression lines, and the confidence limits for regression curve.						
Relating to skills:						
After the classes, a student knows:						
PEK_U01 – how to estimate the uncertainties of direct measurements,						

PEK_U02 – how to calculate the uncertainties on indirect measurements, PEK_U03 – how to estimate the parameters of regression lines and how to linearise non-linear laws. Z zakresu kompetencji społecznych: After the classes, a student knows: PEK_K01 – how to appreciate the quality of an experimental result ; PEK_U02 – how to critically evaluate the veracity of statistical analysis of any data.		
PROGRAMME CONTENT		Liczba godzin
Lectures		
Lec1	Measurables: directs, undirects. Uncertainty: absolute, relative, type A and type B. Determination of experimental uncertainty for direct measures.	2
Lec2	Propagation of errors	2
Lec3	Descriptive statistics: type of means, variance, standard deviation.	2
Lec4	Correlation.	2
Lec5	Regression (linear). Linearisatation of non-linear laws.	2
Lec6	Principle of statistical tests. Basic non-parametric test: khi2.	2
Lec7	Parametric tests: comparison of frequencies and means.	2
Lec8	Non parametric tests. Tests on ranks.	1
	Total contact hours	15
TEACHING TOOLS USED		
N1. Presentation of essential theoretical information (diaporama) N2. PBL (problem based learning) – metrological analysis of laboratory results. N3. Continuous (weekly) verification of progress.		
EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT		
Evaluation (F – forming (during semester), P – concluding (at semester end))	Educational effect number	Way of evaluating educational effect achievement
F1	PEK_U01 - U03	Weekly interrogations
P	PEK_W01-W06, PEK_U01 - U03	Final MCT
PRIMARY AND SECONDARY LITERATURE		
<u>PRIMARY LITERATURE:</u> [1] Michael Sullivan „Fundamentals of statistics” [2] H.Szydlowski “Teoria pomiarow” (in Polish)		
<u>SECONDARY LITERATURE:</u>		
OPIEKUN PRZEDMIOTU (IMIE, NAZWISKO, ADRES E-MAIL)		
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