

Adam Mickiewicz University in Poznań

Faculty of Chemistry

HighChem - interdyscyplinarne i międzynarodowe studia doktoranckie z elementami wsparcia współpracy międzysektorowej

Statistics

Dr hab. Iwona Gulaczyk

Researcher's workshop

Field of science	interdisciplinary
Teaching method	workshop
Language	English
ECTS credits	1
Numbers of hours	15 h
Aims of the course	<ul style="list-style-type: none"> to deepen students' understanding of statistics to teach them how to handle data using statistical tools in order to gain useful information and practical knowledge which is essential for drawing conclusions and making decisions.
Course contents	<p>Describing the data (types of data, graphical tools) Probability, expectation values Probability distributions (the binomial distribution, the Poisson distribution, the Gaussian distribution) Sampling distributions and estimation (central limit theorem, standard error of the mean) Student's t distribution (confidence intervals, determining sample size) Hypothesis testing. One-sample hypothesis tests of the mean (two-sided and one-sided tests). Two-sample hypothesis tests of the mean Hypothesis tests of variance (one-sample test and two-sample test) The F distribution. Chi-square distribution. The analysis of variance (ANOVA). Linear regression analysis (the straight line fit, covariance, correlation)</p>
Prerequisites and co-requisites	Basic knowledge of mathematics and MS Excel is required.

Learning outcomes

On completion of the course PhD candidates will be able to:	Assessment mode
The graduate knows and uses the most important probability distributions	Activity during classes and the final test
The graduate knows and applies hypothesis testing	Activity during classes and the final test

The graduate knows and applies ANOVA	Activity during classes and the final test
The graduate knows and uses linear regression	Activity during classes and the final test
The graduate draws statistical conclusions	Activity during classes and the final test
The graduate is able to describe the statistical data	Activity during classes and the final test
The graduate is able to handle the data using statistical tools in order to gain useful information and practical knowledge	Activity during classes and the final test
The graduate will gain proficiency in using statistical software for data analysis - Statistica	Activity during classes and the final test
The graduate will gain proficiency in using MS Excel and its add-ons like Solver and Analysis Toolpack in order to solve statistical problems	Activity during classes and the final test
The graduate will be able to communicate the major tenets of statistics	Activity during classes and the final test
Literature	1) Statistics, R. J. Barlow 2) Basic statistics, M. J. Kiemele, S. R. Schmidt, R. J. Berdine
Additional information	e-mail to the lecturer - gulai@amu.edu.pl Schedule of Statistics course 20.04.2022, 10:00-12:30 - Describing the data (types of data, graphical tools). Probability, expectation values. 27.04.2022, 10:00-12:30 - Probability distributions (the binomial distribution, the Poisson distribution, the Gaussian distribution). 04.05.2022, 10:00-12:30 - Sampling distributions and estimation (central limit theorem, standard error of the mean). Student's t distribution (confidence intervals, determining sample size). 11.05.2022, 10:00-12:30 - Hypothesis testing. One-sample hypothesis tests of the mean (two-sided and one-sided tests). Two-sample hypothesis tests of the mean. Hypothesis tests of variance (one-sample test and two-sample test). The F distribution. Chi-square distribution. 18.05.2022, 10:00-12:30 - The analysis of variance (ANOVA). Linear regression analysis (the straight line fit, covariance, correlation)