



**DOCTORAL SCHOOL OF THE INSTITUTE
OF IMMUNOLOGY AND EXPERIMENTAL THERAPY
POLISH ACADEMY OF SCIENCES**

Rudolfa Weigla 12, 53-114 Wrocław, Poland szkoladoktorska.hirszfeld.pl

Doctoral School Syllabus

Course Title	Statistical Analysis
Form of classes	Lecture, Workshop
Course coordinator	Mariusz A. Bromke, PhD mariusz.bromke@umw.edu.pl
Lecturer	Mariusz A. Bromke
Number of hours	30
Subject status	Mandatory
Languages of classes	English
Entry requirements	Current version of jamovi software [www.jamovi.org]
Course description	This course provides an introduction to the principles and applications of statistical analysis in biomedical and life sciences. Students learn how to summarize and visualize data, understand probability distributions, formulate and test statistical hypotheses, and select appropriate statistical methods for different types of research questions. The course covers correlation and regression analysis, contingency table (2×2) analysis, survival analysis, analysis of variance (ANOVA), analysis of covariance (ANCOVA), and the fundamentals of meta-analysis. The course concludes with an examination of the covered topics.
Learning outcomes	Knowledge (The graduate knows and understands) • Advanced statistical models applicable to epidemiology and biomedical research. • The theoretical foundations of survival analysis. • The methodology of biomedical experimental design, including the principles of sample size calculation (power analysis) and randomization. Skills (The graduate is able to) • Independently perform data cleaning, transformation, and statistical analysis. • Apply advanced regression models to analyze risk factors and estimate the probability of disease occurrence.



	- Conduct and interpret multivariate analyses, such as cluster analysis and principal component analysis (PCA), using biological data. Social competencies (The graduate is ready to) - Communicate the results of statistical analyses in a precise and accessible manner. P8S_WG, P8S_WK, P8S_UW
Method of verification of learning outcomes	- Continuous monitoring of attendance - Practical examination consisting of the statistical analysis and interpretation of a data set.
Requirements for Course Completion	- Min. 80% attendance - Min. 60% points scored from the exam
Supplementary literature	N/A
Additional information	Each class consists of three teaching hours and includes a theoretical introduction followed by a practical session during which students solve example statistical problems.
Student workload (average number of hours)	Workshop (problem-solving) classes 9 Lectures 18 Independent study of course topics 10 Final examination 3 Total student workload 40 hours