THE SCHEDULE OF TUTORIALS
COURSE NAME: **BIOSTATISTICS**
SECOND YEAR STUDENTS OF FACULTY OF MEDICINE

No.	Topic	Date/group of Students
1.	Introduction to biomedical statistics. Descriptive statistics	17.11.2025/gr.: 1, 2, 3
2.	Sample distribution and normal distribution. Hypothesis testing: Part 1 – parametric tests	24.11.2025/gr.: 1, 2, 3
3.	Hypothesis testing: Part 2 – nonparametric tests. Correlations and linear regression	01.12.2025/gr.: 1, 2, 3

Teachers: Dr hab. Celestyna Mila-Kierzenkowska, prof. UMK, dr hab. Karolina Szewczyk-Golec, prof. UMK, dr Marta Pawłowska, dr Roland Wesołowski, dr Joanna Wróblewska, dr Paweł Sutkowy, mgr Jarosław Nuszkiewicz

Leading textbook:
Wayne W. Daniel and Chad W. Cross: Biostatistics: a foundation for analysis in the health sciences. John Wiley & Sons, Ltd., cop. 2011.

Supplementary textbooks:
1. A. Källén: Understanding biostatistics. John Wiley & Sons, Ltd., cop. 2011.
2. Marc M. Triola, Mario F. Triola: Biostatistics for the biological and health sciences. Pearson/Addison Wesley, cop. 2006.

Tutorial 1
Introduction to biomedical statistics. Descriptive statistics. At the first class the Student will get to know the basic concepts used in statistics: population, sample, variable, qualitative variables, quantitative variables, variable scales (nominal, ordinal, interval), probability, frequency, ratio, proportion, percent. The Student will learn the theory of the most important descriptive statistics and will learn to apply them in practice. It will find out what are the most commonly used measures of central tendency and measures of dispersion (respectively: arithmetic mean and median as well as variance, standard deviation and coefficient of variation).

Tutorial 2
Sample distribution and normal distribution. Hypothesis testing: Part 1 – parametric tests. At the second tutorial, the Student will learn the theory of the sample distribution and the normal distribution and will get to know how to perform statistical analysis of the results obtaining as a result of scientific research. It will learn practical applications of parametric tests and to study the tests assumptions: Kolmogorov-Smirnov test and Shapiro-Wilk test, Student's t test for dependent and independent samples, Levene's test and ANOVA along with *post hoc* analysis.

Tutorial 3

Hypothesis testing: Part 2 – nonparametric tests. Correlations and linear regression. During the last, third class, the Student will learn to use nonparametric tests, which are employed when the assumptions of the parametric tests are not met (Wilcoxon test, U Mann-Whitney test, Kruskal-Wallis H test with *post hoc* analysis). At that tutorial the Student will also learn the theory of linear regression and correlation. It will get to know and learn to calculate the Pearson's and Spearman's correlation coefficients. The student will also learn graphic presentation of results of linear regression using a spreadsheet and statistical program.