Syllabus

Subject: **Statistical Workshop**

Teacher: mgr Arleta Kędra

Aim of the course is to show the Students how wide the spectrum of Statistics' application is. The Students will be taught how to use not only basic statistical methods but also more advanced ones, basing on real-life examples provided for each topic. Learning Statistics within the course will be completed with preparation of a group project, basing on data found and examined by students with the help of a teacher.

1. **Introductory information**
   a. What is Statistics? Aims and methodology
   b. Basis information on statistical data
      i. Types of variables
      ii. Examples
   c. Application of Statistics in a modern world
2. **Describing data**
   a. **Mean**
      i. **Arythmetic**
      ii. **Geometric**
      iii. **Harmonic**
      iv. **Moving**
   b. **Median**
   c. **Quantiles**
   d. **Assymetry**
   e. **Kurtosis**
3. **Relations between variables**
   a. Linear correlation
   b. Simple regression
4. **Distribution of discrete random variables**
   a. Normal
   b. Poisson
   c. Binominal
5. **Hypothesis testing**
   a. Null and alternative hypotheses
   b. Distribution for hypothesis testing
   c. Examples
6. **Group project**
   a. Finding appropriate topic and data set
   b. Choosing correct methodology
   c. Conducting research
   d. Presenting results during classes

Literature:

1. A. Abebe et al., *Statistics and Data Analysis,* Western Michigan University, Michigan, 2001.
2. P. Sahoo, *Probability and Mathematical Statistics,* University of Louisville, Louisville, 2013.
3. B. Illowsky et at., *Introductory Statistics,* Rice University, Houston, 2013.