Course description:

Program:

1. The concept of probability, event space, the concept of a random variable, its distribution and
   makeup.

2. Discrete random variables (distributions: Bernoulli, geometric, Poisson, hypergeometric).

3. Continuous random variable (schedules: uniform, exponential, gamma, normal, beta, Weibull).
   Characteristics of random variables - moments.

4. Multivariate distributions of random variables (two-dimensional distribution, conditional distribution,
   marginal distribution, independence of two random variables); Covariance and correlation matrices. Multivariate normal
   distribution and the special case of two-dimensional (ellipse of concentration, simple regression).

5. Features of two-dimensional random variables. Determining the density and distribution functions
   random variables.

6. Characteristic function and its properties. Relationship with the characteristic function moments
   variable.

7. Population and sample. Timetables radii (chi-square, Student's t-F-Snedecor). central
   limit theorem.

8. Point and interval estimation. Testing statistical hypotheses. verification of compliance
   distributions.

9. Linear regression and analysis of variance - introduction.

Requirements:

Knowledge of the basic concepts of linear algebra: linear space, and linear transformation matrix, matrix
operations.

Analysis: Learn how to calculate basic integrals, integration by substitution and by parts; double integrals.

Recommended reading (textbooks)

Gernstenkorn, Śródka - Combinatorics and Probability. Majsnerowska - Introduction to the
probability of tasks. Sobczyk - Statistics.

Jakubowski Sztencel - Probability for (almost) everyone.