

Math and Statistics Refresher

module 1, 2024/2025

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Course description

The main goals of the course are the following:

- to refresh the bases of probability theory;
- to learn the bases of mathematical statistics;
- to introduce the principles of statistical modeling.

Course requirements, grading, and attendance policies

The course doesn't have any special prerequisites. It consists of 14 lectures and 4 seminars. There will be 7 home assignments which will constitute 35% of the final grade. The final exam will account for the remaining 65%.

Course contents

The course covers the following topics:

1. Basic combinatorics
2. Descriptive Statistics
3. Probability Theory
4. Bayesian Statistics
5. Discrete Distributions (Binomial, Poisson and More)
6. Continuous Distributions (Normal and Others)
7. Hypothesis Tests

Description of course methodology

Lectures' main goal is to help students feel comfortable with the use of terminology. Big part of the lecture is devoted to providing examples and solving typical problems. During the seminar students will revise the material and try to increase the confidence and speed of solving the problems.

Course materials

Required textbooks and materials

1. V.Chistyakov. The course on Probability Theory (5th edition), Moscow, "Agar", 2000 (in Russian: Чистяков В.П. Курс теории вероятностей (5-е издание). М., «Агар», 2000).
2. V.Gmurman. Probability Theory and Mathematical Statistics. Moscow, "Higher School", 2003 (in Russian: Гмурман В.Е. Теория вероятностей и математическая статистика, М., "Высшая школа", 2003).

Additional materials

1. Sh. Ross. A First Course in Probability, Pearson, Prentice Hall, 2009.

Academic integrity policy

Cheating, plagiarism, and any other violations of academic ethics at NES are not tolerated.