| Title | Code |
|---|---|
| **Probabilistic Methods and Statistics** | **1010341551010340723** |
| Field: **Mathematics** | Year / Semester: **3 / 5** |
| Specialty: **-** | Course: **core** |
| Hours: Lectures: **2** Classes: **2** Laboratory: **2** Projects / seminars: **-** | Number of credits: **9** |
| | Language: **polish** |

## Lecturer:

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## Status of the course in the study program:

Obligatory course of the study program for Mathematics at the Faculty of Electrical Engineering.

## Assumptions and objectives of the course:

An introduction to the theory of random variables, mathematical statistics and mathematical modeling of random experiments.

## Contents of the course (course description):

Probability space as a model of random experiment. Basic operations on events. Conditional probability. Independent and dependent events. Total probability. Bayes? theorem. Elements of the combinatorics. Reliability of the multicomponent system. Random variable (RV) with real values and bivariate RV. Cumulative distribution function (CDF) and ISO Norms. Discrete and continuous RV?s. Dependent RV?s. A sequence of mutually independent and identically distributed (IID) RV?s. Probability mass function (PMF) and probability density function (PDF). Distribution parameters. A quantile function (INVCDF). A function of RV. Method of Monte Carlo simulation of the distribution. Numerical characteristics of RV. Review of often used probability distributions. Lows of large numbers and the Central Limit Theorem (CLT) with applications. Descriptive statistics. A statistical population and a random sample. Empirical distribution. Methods of estimation of the population parameters. Some constructions of the parametric and nonparametric hypotheses testing. Types of errors in a hypothesis test. Review of the statistical packages. -

## Introductory courses and the required pre-knowledge:

Fundamentals of the formal logic, set theory and mathematical analysis.

## Courses form and teaching methods:

Exposition of theoretical concepts and practical resolution of problems with and without computer assistance.

## Form and terms of complete the course - requirements and assessment methods:

Regular written tests and written / oral final exam.

## Basic Bibliography:

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## Additional Bibliography:

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