

# PROBABILITY THEORY AND MATHEMATICAL STATISTICS

## COURSE SYLLABUS ABSTRACT of higher education institution

Speciality 1-28 01 02 – Digital Marketing

|   | STUDY MODE |                                  |
|---|------------|----------------------------------|
|   | full-time  | part-time<br>(shortened program) |
| Year  | 2          | 3                                |
| Semester                                      | 3          | 5                                |
| Lectures, hours                               | 16         | 4                                |
| Practical classes (seminars), hours           | 34         | 6                                |
| In-class test (semester, hours)               | –          | 5 (2 h)                          |
| Exam, semester                                | 3          | 5                                |
| Contact hours                                 | 50         | 12                               |
| Independent study, hours                      | 58         | 96                               |
| Total course duration in hours / credit units | 108 / 3,0  | 108 / 3,0                        |

**1. Course outline. Random events.** Random variables and their distribution functions. Numerical characteristics of random variables. Basic distributions of random variables. Multivariate random variables. Conditional law of distribution. Independence of random variables. The law of large numbers. Central limit theorem. Sampling. Graphic image of the sample. Empirical distribution function. Point estimation. Interval evaluation. Testing statistical hypotheses. Homogeneity criteria. Elements of regression and correlation analysis.

**2. Course learning outcomes.** Upon completion of the course, students will be expected to know:

- the basic provisions, formulas and theorems of probability theory and mathematical statistics;
- the basic types of probability distributions used in statistical analysis;
- the main methods of statistical processing and analysis of random experimental data;

be able to:

- perform actions on random events and probabilities of their implementation;
- operate with numerical characteristics and basic distributions of random variables;
- argue the possibilities of applying the basic theorems of probability theory;
- interpret the results of probabilistic analysis using the theory of qualitative behavior of random variables, statistical criteria and statistical estimates;
- apply the theoretical provisions of the topic to solving the applied problems of economic practice.

possess:

- how to use the applied methods of probability theory and mathematical statistics;
- proficiency in numerical calculation of basic characteristics required for probabilistic and statistical analysis in tasks arising from economic practice.

**3. Competencies formed:** have the skills of creative and analytical thinking (SC-12); use the tools of probability theory and mathematical statistics to form a probabilistic approach in engineering activities (BPC-4).

**4. Requirements and forms of midcourse evaluation and summative assessment**

Modular rating system is used. Intermediate certification: control work. Current evaluation: exam.