

Master's program 8.04020101 «Mathematics», specialization "Probability theory and mathematical statistics"

Specialty "Probability Theory and Mathematical Statistics" was founded at Kyiv University in 1958 as a part of educational direction "Mathematics".

Now this specialty includes the following sections: probability theory, mathematical statistics, theory of random processes and fields, stochastic analysis, stochastic differential equations, actuarial and financial mathematics, cryptography and cryptanalysis, computer statistics and some others. .

The term of study is 2 years full-time education. Bachelors of mathematics and statistics can enter the program.

Graduates get qualification of "mathematics" and can hold listed primary positions:

- 2121.1 Junior research fellow (mathematics)
- 2121.2 Mathematician
- 2310.2 Assistant
- 2310.2 Teacher of higher education institution

Also, masters of mathematics can work as system analysts, managers, specialists in IT-technologies, researchers and teachers of mathematics, computer science, probability disciplines, mathematical economics, actuarial sciences in a variety of state and private institutions and organizations.

The curriculum of two years studying includes the following normative disciplines in four cycles:

1. Cycle of professionally oriented humanitarian and socio-economic training

- Philosophical problems of natural science (*126 hours, 3,5 credits ECTS, I semester*)
- Business Foreign Language (*144 hours, 4 credits ECTS, I semester*)
- Methodology and Organization of Research (*36 hours, 1 credit ECTS, I semester*)
- Intellectual property (*36 hours, 1 credit ECTS, I semester*)
- The Psychology of teaching (*72 hours, 2 credits ECTS, II semester*)
- The Pedagogy of Higher School (*72 hours, 2 credits ECTS, III semester*)
- Methods of teaching mathematics in high school (*72 hours, 2 credits ECTS, III semester*)

2. Cycle of professionally oriented mathematical and natural-scientific training

- Actuarial and financial mathematics (*180 hours, 5 credits ECTS, I semester*)

- Differential equations with partial derivatives (*126 hours, 3,5 credits ECTS, II and III semesters*)
- Approximation theory (*72 hours, 2 credits ECTS, I semester*)
- Dynamical Systems (*126 hours, 3,5 credits ECTS, I and II semesters*)
- Mathematical models in natural science (*126 hours, 3,5 credits ECTS, II and III semesters*)
- Modern topology (*108 hours, 3 credits ECTS, II semester*)

3. Cycle of professional and practical training

- Mathematical economics (*144 hours, 4 credits ECTS, III semester*)
- Mathematical foundations of information security (*108 hours, 3 credits ECTS, I semester*)
- Computer statistics (*72 hours, 2 credits ECTS, III semester*)

4. Cycle of student and higher education selection disciplines

- Operations research (*126 hours, 3,5 credits ECTS, II semester*)
- Algebraic geometry and its applications to cryptography (*126 hours, 3,5 credits ECTS, II semester*)
- Generalized functions and their applications (*72 hours, 2 credits ECTS, III semester*)
- Nonlinear analysis and its application (*72 hours, 2 credits ECTS, III semester*)
- Markov processes in actuarial mathematics (*72 hours, 2 credits ECTS, I semester*)
- Mathematical models in mechanics of continuous media (*72 hours, 2 credits ECTS, I semester*)
- Harmonious analysis (*72 hours, 2 credits ECTS, II semester*)
- Theory of Graphs and its applications (*72 hours, 2 credits ECTS, II semester*)
- Spline functions and its applications (*72 hours, 2 credits ECTS, II semester*)
- Analytical methods for the theory of evolution equations (*72 hours, 2 credits ECTS, II semester*)

Block of special courses "Probability theory and mathematical statistics" consists from:

- Random processes in Orlicz spaces (*72 hours, 2 credits ECTS, I semester*)
- Generalized processes of fractional Brownian motion (*72 hours, 2 credits ECTS, II semester*)
- Stochastic differential equations (*108 hours, 3 credits ECTS, II semester*)
- Stochastic analysis. Statistics of random processes. Probabilistic methods of cryptanalysis (*288 hours, 8 credits ECTS, III semester*)
- Diffusion processes (*72 hours, 2 credits ECTS, I semester*)

- Scientific seminar on the theory of stochastic processes and stochastic analysis (*180 hours, 5 credits ECTS, I and II semesters*)
- Scientific seminar on the theory of probability and mathematical statistics (*144 hours, 4 credits ECTS, III semester*)

Students of qualification level "Master of mathematics" are teaching for six weeks and perform practical training for four weeks. Also, they take state exam in mathematics and defend master's diploma.