Master Program: Data Science

(Direction of training: 02.04.02 - Fundamental informatics and information technology)

List of basic disciplines

- *Theory of quantum computing and algorithms*
- *Modern programming technologies*
- *Machine learning*
- *Big data analysis*
- *SAS (Statistical Analysis System) technology*
- *Data mining*
- *Big data in management and engineering*
- *Statistical methods of economics and finance*
- *Optimization methods*
- *Models and methods of approximation in management problems*
- *Iterative methods for solving optimal control problems*

Data science *is a branch of computer science that studies the problems of analyzing, processing and presenting data in digital form. It combines methods for data processing and high level of parallelism, statistical methods, data mining methods and applications of artificial intelligence for working with data, as well as methods for designing and developing databases. Largely due to the popularization of the concept of "big data", it is considered as a practical interdisciplinary field of activity. Moreover, a data scientist is one of the most attractive, highly paid and promising professions since the beginning of the 2010s.*

The main practical goal *of professional activity in data science is the detection of patterns in data and the extraction of knowledge from data. The skills required by a specialist are reflected in the intersection of areas of substantive expertise, practical experience in information technologies (hacking skills) and knowledge of mathematical statistics.*

A feature *of the discipline is the priority of practical applicability of the results, that is, the success of predictions, over their causality, whereas in traditional research areas it is essential to explain the nature of the phenomenon. Data science is largely based on the methods of classical statistics and involves the study of very large heterogeneous arrays of digital information and links with information technologies. Data science assumes reliance on mathematical statistics, artificial intelligence and machine learning.*

The main results of the program: *Graduates of the master program should receive fundamental knowledge in the field of data science and operations research and understanding of the various applications of this knowledge. Undergraduates acquire the skills of independent research work: the ability to work with the scientific literature, the ability to analyze and process data and carry out mathematical modeling in various fields, including economics, management and engineering.*

Alexander Lapin, Professor, Department of Mathematical Statistics, Institute of Computational Mathematics and Information Technologies,

e-mail avlapine@mail.ru