

Ministry of Education and Science of the Russian Federation

Plekhanov Russian University of Economics

Faculty of Distance Learning

Department of Information Technology

**ANNOTATION OF THE WORKING PROGRAM OF THE
EDUCATIONAL DISCIPLINE**

B1.V.DV.01.01 INSTRUMENTAL METHODS OF ECONOMICS

Direction of studies 38.04.01 "Economics"

Program focus Equity Management

Level of higher education Master

Program of studies Academic Master Program

Moscow, 2019

1. The purpose and objectives of the discipline:

The purpose of the discipline is to teach students instrumental methods and technologies of computer modelling of economic processes. The knowledge gained will enable students to use universal integrated statistical packages, analytical information systems, packages of neural network modelling, and to apply methods of intellectual analysis of economic data.

Educational tasks of the discipline

Tasks are determined by the content and specific features of the subject.

- deepening theoretical knowledge in the field of statistical modelling based on the use of modern computer technologies;
- studying the methodology for using universal integrated statistical packages;
- studying the conditions and the sphere of the most effective application of various economic and statistical methods in the analysis and modelling of economic processes;
- studying methods of intellectual analysis of economic data;
- studying methods of using analytical information systems;
- deepening knowledge in the area of theory and modelling methods based on the use of neural networks;
- studying the methodology for using neural network modelling packages.

2. Requirements for the results of mastering the discipline

(Planned learning outcome)

As a result of studying the discipline, the following competences should be formed:

Competence codes	Competence name	Definition and structure of the competence	
GENERAL CULTURAL COMPETENCES			
OC-1	Ability of abstract thinking, analysis and synthesis	Know	rules for assessing a person's intellectual and cultural level
		Be able to	improve their intellectual and cultural level using computer technology
		Master	the ability to improve their intellectual and cultural level using computer technology
OC-3	Readiness for self-development, self-realization and using creative potential	Know	possibilities of information technologies for practical use of new knowledge and skills, including new areas of knowledge not directly related to the area of activities
		Be able to	independently acquire (among other ways, with the use of information technology) and apply in practice new knowledge and skills, including new areas of knowledge not directly related to the area of activities.
		Master	the ability to independently acquire (among other ways, with the use of information technology) and apply in practice new knowledge and skills, including new areas of knowledge not directly related to the area of activities.

Forms of control

Formative and summative assessment is carried out by the lecturer and the teacher conducting seminars in accordance with the thematic plan.

*Interim certification: **exam (zachiot).***

3. The content of the discipline:

No.	The name of the theme	Content
1	Tasks, methods and technologies of computer modelling in economic research	The concept of placement and issue of securities. Open and instrumental methods of economics: purpose and sphere of application. Computer modelling of economic processes and phenomena: tasks, methods and technologies. Trends in the development of instrumental methods of economics.
2	Information technologies for statistical modelling of economic processes	Information technologies for statistical modelling of economic processes. Stages of statistical analysis. The system of economic and statistical models of analysis, forecasting and planning and the principles of its construction. Information base of statistical analysis and modelling. Information technologies for statistical analysis of non-numerical data. Correlation and regression models. Multidimensional statistical methods.
3	Methods and technologies of intellectual analysis of economic data	The tasks of analyzing economic data. Methods of intellectual analysis of data. Intellectual analysis of marketing data. Online analytical processing (OLAP). Data warehousing. Cleaning and filtering data. Analysis of multidimensional data, the search for hidden patterns (Data mining, Web mining). Decision trees. Genetic data analysis algorithms. Analytical information systems: purpose, composition, sphere of application.
4	Methods and technologies of neural network modelling of economic processes	The concept of a neural network and its main types. Biological and formal neuron. Structure, functions. The main properties of biological and artificial neural networks. Ways to implement neural networks. The place of neural network modelling among other methods of solving problems. Types of tasks solved by neural networks. Disadvantages and limitations of neural networks. Types of activation functions. Multilayer perceptron. Structure, work algorithm. Stages of solving the problem with the use of neural networks. Features of structure and work. Formalization of problem conditions for neural networks. Preparation of input and output data. The choice of the number of layers. Learning neural networks with a teacher. Error back propagation method. Generalization and abstraction in teaching neural networks. Learning neural networks without a teacher. The Kohonen network. The Kohonen layer training. The main packages of neural network data analysis.

Developers:

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