

**1. Name.** Mathematical Methods, Models and Information Technologies in Scientific Researches

**2. Code.** 11143, 11144

**3. Type.** General education

**4. Year of study.** 2018-2019

**5. Semester.** I

**6. Number of ECTS credits - 5.**

**7. Name of the Lecturer, degree, position.**

Klebanova Tamara Semenivna, Doctor of Economic Sciences (DSc), Prof.

Ushakova Iryna Oleksiyivna, Candidate of Economic Sciences (PhD), Assoc.Prof.

**8. Learning outcomes:**

the ability to integrate knowledge related to multidimensional economic objects (processes) assessment and analysis and to choose the methods and models of their research in conditions of uncertainty and risk;

the ability to use information technology and software tools in scientific research

**9. Compulsory previous academic disciplines.**

Higher Mathematics, Probability Theory and Mathematical Statistics, Basics of Statistics, Econometrics, Applied Econometrics, Optimization of Economic Systems, Informatics, Business Communication, Macroeconomics and Microeconomics.

**10. Content.**

Simulation as a method of scientific cognition of complex systems. Features of multidimensional statistical data processing. Methods of multidimensional processing, juxtaposition and modeling of aggregates. Features of application of cluster analysis methods. Classification of cluster procedures. Hierarchical sintering and iterative cluster procedures. Alternative methods of multidimensional objects classification. Classification with learning. Discriminatory analysis methods. Methods of reducing the space of signs. Algorithm of gravity center method. Taxonomic index of the level of development. Models and methods of factor analysis. The method of the main factors. Assessment of classification factors and tasks.

Main features of cloud technologies. Types of cloud technologies. Main types of cloud services. Information technology in business communications. Scientific project as an object of management. Instrumental means of project management. Fundamentals of visualization of information. Types and methods of visualization of information. Mental maps, infographics. Science and science metric. Scientometric database of Web of Science. Scientometric database of Scopus. Promotion of scientific articles. Research Identity Register ORCID. Information technology in ethics research testing.

**11. Recommended sources.**

1. Borovikov V. P. STATISTICA Statisticheskii analiz i obrabotka dannykh v srede WINDOWS / V. P. Borovikov, I. P. Borovikov. - M. : Informatsionno-izdatel'skiy dom "Filin", 1997. - 608 s.

2. Borovikov V. P. STATISTICA: iskusstvo analiza dannykh na komp'yutere. Dlya professionalov / V. P. Borovikov, - SPb. : Piter, 2001. - 656 s.

3. Dubina I. N. Matematiko-statisticheskiye metody v empiricheskikh sotsial'no-ekonomicheskikh issledovaniyakh: ucheb. posobiye / I. N. Dubina. - M.: Finansy i statistika; INFRA-M. 2010. - 416 s.

4. Dubrov A. M. Mnogomernyye statisticheskiye metody / A. N. Dubrov, V.S. Mkhitaryan, L. I. Troshin; - M.: Finansy i statistika, 1998. - 350 s.

5. Kram R. Infografika. Vizual'noye predstavleniye dannykh / R. Kram. - SPb.: Piter, 2015. - 384 s.

6. Luparenko L. A. Instrumentariy Vyyavleniya plahiatu v naukovykh robotakh: analiz prohrannykh RISHEN [Elektronnyy resurs] / L. A. Luparenko // Informatsiyi tekhnolohiyi y zasoby navchannya. - 2014. - Tom 40. - №2

7. Metodicheskiye rekomendatsii po podgotovke i oformleniyu nauchnykh statey v zhurnalakh, indeksiruyemykh v mezhdunarodnykh nauko-metricheskikh bazakh dannykh / Assotsiatsiya nauchnykh redaktorov i izdateley; pod obshch. red. A.V. Kirillovoy. - M, 2017. - 144 c.

8. Mnogomernyy statisticheskiy analiz v ekonomike: uchebn. posob. dlya vuzov / L. A. Soshnikova, V. N. Tamashevich, G. Uebe, M. Shefer; pod red. prof. V. N. Tamashevicha. - M.: YUNITI - DANA, 1999. - 598 s.

9. V produktakh Google [Elektronnyy resurs]. - Rezhim dostupa: <https://www.google.com.ua/intl/ru/about/products/>

## **12. Methods of training.**

Lectures, laboratory lessons, problem-oriented lectures, work in small groups, computer simulation, presentations.

## **13. Evaluation methods:**

- current control (active work at lectures, active participation in the implementation of laboratory tasks, conducting ongoing tests, performing an individual research task);

- modular control (complex test);

- final control (differentiated credit).

## **14. Language of training.** Ukrainian