



SYLLABUS "STATISTICS"

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Department responsible for the course or equivalent: Institute of Management in Economic, Ecological and Social Systems; Department of Business Economics

Semester when the course unit is delivered: 3rd

Level of course unit: Bachelor level

ECTS credits: 5

ADMISSION REQUIREMENTS

Applicants are expected to have completed the following course:

- Mathematics.

COURSE OBJECTIVES (AIMS)

The aim of the course is the formation of general cultural and professional competencies, the acquisition and improvement of theoretical knowledge and practical skills, including the formation of theoretical knowledge and basic practical skills in students regarding the application of methods of quantitative statistical analysis in various economic situations and business - processes.

Course objectives:

- to learn how to use statistical tools to ensure and implement trade and technological processes at the enterprise;
- to learn how to use statistical tools to ensure distribution of goods, its accounting, minimizing distribution costs, including commodity losses;
- to consider possible tools for collecting, storing, processing, analyzing and evaluating information necessary for organizing and managing commercial, marketing, advertising, logistics and merchandising activities;
- to study the basics of conducting research on individual topics (stages, tasks) in accordance with approved methods;
- to learn how to participate in the development of innovative methods, tools and technologies for professional activities;
- to learn how to use statistical mechanisms to develop projects of trade and technological processes and systems in the field of commerce using information technology;
- to learn how to participate in the implementation of projects in the field of commerce.

COURSE CONTENTS

Module 1. General Statistics Theory

Topic 1. The subject, tasks and system of indicators of statistics of commercial activity

- The origin and development of statistics in the world and in Russia;
- The concept of "Statistics", the subject and object of statistical science;
- Commercial activity as a subject of statistical research;
- Tasks and system of indicators of statistics of commercial activity;
- Statistical analysis



of types of economic activity; • Entrepreneurship as an object of statistical observation in official and alternative statistics.

Topic 2. Statistical observation. Generalization and analysis of materials of statistical observation

• Statistical observation and its tasks; • Forms and types of statistical observation, methods of obtaining data; • Programmatic and organizational issues of statistical observation; • Main directions and tools of statistical analysis; • The nature and types of groups, statistical tables; • Generalized statistical indicators; • Graphical methods for providing statistical indicators.

Topic 3. Average values and indicators of variation. Selective observation

• Average values, their essence and value; • Types of average values; variation of signs, indicators of the structure of the variation series; • Indicators of size and form of variation; • The concept of selective observation; • The main ways of forming a sample; • Determination of the required sample size; • Sampling error.

Topic 4. Statistical study of the relationship of socio-economic phenomena

• The concept of statistical communication; • Parallel row method; • Rank correlation coefficient; • Concordance coefficient; • Linear correlation coefficient; • Regression analysis.

Topic 5. Time series

• The concept of the time series; • Indicators of the time series; • Average dynamics over the period; • Methods for measuring periodic oscillations.

Topic 6. Indices

• The concept and meaning of indices; • Aggregate index – the main form of the general index; • Average indices; • Basic and chain indices; • Indices of variable and constant composition, structural shift index; • Territorial indices.

Topic 7. Statistics of national accounts and statistics of national wealth. Financial instruments of socio-economic statistics

• State budget statistics; • Money circulation statistics; • The concept and structure of the system of national accounts: key indicators, methods for their calculation; • Gross domestic product and methods for its calculation; • Concept and methods of assessing national wealth.

Topic 8. Statistics of the population and the labor market

• Characteristics of the size, composition and territorial distribution of the population; • Statistics of natural and mechanical movement of the population; • Methods of mathematical modeling in population statistics; • Statistics of labor potential and labor market; • Statistics of the level and quality of life of the population.

Module 2. Statistics of Business enterprise

Topic 9. Statistics of fixed and working capital of an enterprise

• Types of estimates of fixed assets of an enterprise; • System of indicators of the availability, composition and movement of fixed assets; • Material consumption of production and a comprehensive assessment of the effectiveness of the use of working capital of the enterprise; • Determination of the needs of the enterprise in working capital and the methodology of its planning.

Topic 10. Statistics of trade in goods and services

- Tasks and a system of indicators for statistics of trade in goods and services;
- Analysis of the dynamics and structure of trade;
- Performance assessment of contractual obligations.

Topic 11. Inventory and turnover statistics

- Tasks of inventory and turnover statistics; a system of indicators for statistics on inventories and turnover;
- Methods for assessing the optimality of inventory;
- Methods for analyzing the state and changes in inventories;
- Inventory turnover analysis.

Topic 12. Price statistics

- Tasks and system of indicators of price statistics;
- Principles and methods of registration and price summary;
- Analysis of the level and volatility of prices;
- Analysis of price level dynamics;
- Modeling and forecasting prices.

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- Tasks and system of indicators of price statistics;
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- Analysis of the level and volatility of prices;
- Analysis of price level dynamics;
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Topic 14. Labor statistics

- Tasks and a system of indicators of labor statistics in commercial activities;
- Analysis of the number and composition of labor resources;
- Analysis of the dynamics of the number of employees and staff turnover;
- Analysis of the use of working time;
- Analysis of the effectiveness of labor costs, quality of labor;
- Pay analysis of employees of commercial structures.

Topic 15. Finance statistics

- Analysis of profit and profitability;
- Business activity analysis;
- Assessment of the financial condition of the enterprise;
- Statistical accounting of indicators of financial results of entrepreneurship;
- Forecasting financial results in entrepreneurship.

LEARNING OUTCOMES

Knowledge:

- how to use possible tools for collecting, storing, processing, analyzing and evaluating information necessary for organizing and managing commercial, marketing, advertising, logistics and merchandising activities;
- to apply statistical mechanisms for the development of projects of trade and technological processes and systems in the field of commerce using information technology.

Skills:

- to conduct scientific research on separate sections of topics (stages, tasks) in accordance with approved methods; take part in the implementation of projects in the field of commerce
- to take part in the development of innovative methods, tools and technologies for professional activities.

Experience:

- to provide and carry out trade and technological processes at the enterprise;



- to provide of goods distribution, its accounting, minimization of distribution costs, including commodity losses.

PLANNED LEARNING ACTIVITIES AND TEACHING METHODS

Interim attestation: Exam

Comprehensive development of student discipline involves:

- students' presentations with pre-prepared abstracts on problem-oriented topics formulated by the lecturer, after which the audience discusses their level and, if necessary, answers are supplemented, or their shortcomings are noted under the guidance of the lecturer conducting the seminar;
- problem solving;
- control classes (testing on module topics).

ASSESSMENT METHODS AND CRITERIA

Criteria for evaluation:

Testing

- 10 points for 24-25 correct answers;
- 9 points for 22-23 correct answers;
- 8 points for 19-21 correct answers;
- 7 points for 17-18 correct answers;
- 6 points for 14-16 correct answers;
- 5 points for 12-13 correct answers;
- 4 points for 9-11 correct answers;
- 3 points for 7-8 correct answers;
- 2 points for 4-6 correct answers;
- 1 point for 2-3 correct answers;
- 0 point for 0-1 correct answer.

Abstracts

- 5 points – Relevance, purpose and objectives: the problem is clearly identified and its relevance is justified, the goal is formulated, the research objectives are defined. Structure: the text is divided into sections, there are no errors in text structuring. Design: volume is maintained, requirements for external design are met. The text contains at least one figure and one table. References: The requirements of GOST 7.32-2001 and GOST 7.0.5-2008 with respect to bibliography and references are met. References include textbooks, scientific and popular science journals, legal acts, and links to electronic publications. The age of the sources is not older than 10 years. Text quality: a problem analysis was carried out involving several sources of literature, its own position was logically stated, conclusions were drawn, the topic was fully disclosed, links to sources from the list of literature were indicated. Protection: demonstrates a complete understanding of the described problem, gives correct answers to all questions on the topic of the essay, presents a high-quality presentation;
- 4 points – Relevance, purpose and objectives: the problem is not clearly defined, there is a rationale for its relevance, a goal is formulated, research objectives are defined. Structure:

the text is divided into sections, there are no gross errors in text structuring. Design: the text of the abstract is framed with minor violations of the design requirements set forth in this document, the volume is maintained. The text contains at least one figure and one table. References: when compiling an abstract, most of the requirements of GOST 7.32-2001 and GOST 7.0.5-2008 with respect to bibliography and references are met. References include textbooks, scientific and popular science journals, legal acts, and links to electronic publications. The age of the sources is not older than 10 years. Text quality: a problem analysis was carried out involving several sources of literature, its own position was logically stated, conclusions were drawn, the topic was fully disclosed, links to sources from the list of literature were indicated. Protection: demonstrates a significant understanding of the problem, answers are not given to all questions or answers are incomplete, there are minor flaws in the presentation

- 3 points – Relevance, purpose and objectives: the relevance of the problem is insufficiently substantiated, the purpose and objectives of the study are not formulated. Structure: the text is divided into sections, there are errors in text structuring. Design: The text of the abstract is framed with violations of the design requirements set forth in this document, the volume is not met, there are no figures and tables. References: when compiling the abstract, the requirements of GOST 7.32-2001 and GOST 7.0.5-2008 with respect to bibliography and references are partially observed. The list of references is framed with violations of the quality and age requirements of the sources. Text quality: the analysis of the problem was carried out according to one source of literature, there are no conclusions, the topic is not fully disclosed. Protection: demonstrates a partial understanding of the problem, answers are given only to basic questions, the presentation is presented with significant violations
- 0-2 points – Relevance, purpose and objectives: there is clearly no justification for the relevance of the problem, the purpose and objectives of the study. Structure: the text is not divided into sections or there are gross errors in structuring the text. Design: the text of the abstract is framed with gross violations of the design requirements set forth in this document. References: during the preparation of the abstract, the requirements of the standards GOST 7.32-2001 and GOST 7.0.5-2008 with respect to bibliography and references are either not complied with or there is no list of references. Text quality: the topic is not disclosed, the requirements for the task are not fulfilled. Protection: demonstrates a lack of understanding of the problem, there are no answers to questions or answers are incorrect, there are obvious violations in the presentation.

Problem solving

Grading is carried out according to the following principle: 1 point for each correctly solved problem in a seminar by the first three students. Maximum – 15 points.

Exam

- An “excellent” grade is given to a student, if he or she demonstrates full understanding of the issue mentioned in the questions.
- A “good” grade is given to a student, if he or she demonstrates high understanding of the issue mentioned in the questions. There are some inaccuracies in the answer. A total “good” grade is also given for examination, if a student gives an “excellent” grade for one question, and he or she gives a “satisfactory” grade for answering the second question.
- A “satisfactory” grade is given to a student, if he or she does not demonstrate full understanding of the issue mentioned in the questions. There are significant inaccuracies in



the answer. A total “satisfactory” grade is also given for examination, if a student gives a “good” grade for one question, and he or she gives a “satisfactory” grade for answering the second question. If a student answers one question with an “excellent” grade, and he or she does not answer the second question, an “unsatisfactory” grade is given.

- An “unsatisfactory” grade is given to a student, if he or she demonstrates lack of understanding of the issue. There is no answer to the questions. A student’s answer is not associated with a topic given in the question.

COURSE LITERATURE (RECOMMENDED OR REQUIRED)

1. Michael J. Evans and Jeffrey S. Rosenthal Probability and Statistics [Electronic Resource]. – URL: <http://www.utstat.toronto.edu/mikevans/jeffrosenthal/book.pdf>
2. Hon K. An Introduction to Statistics [Electronic Resource]. – URL: https://www.fd.cvut.cz/departament/k611/PEDAGOG/THO_A/A_soubory/statistics_firstfive.pdf
3. Michael J de Smith. Statistical Analysis Handbook [Electronic Resource]. – URL: <https://www.statsref.com/StatsRefSample.pdf>
4. David M. Lane. Introduction to Statistics. [Electronic Resource]. – URL: http://onlinestatbook.com/Online_Statistics_Education.pdf
5. The Economist – <https://www.economist.com>
6. Science Library elibrary.ru – www.elibrary.ru
7. The World Bank – <https://www.worldbank.org>
8. The Organisation for Economic Co-operation and Development (OECD) - <https://www.oecd.org>
9. The Institute for Statistics education - <https://www.statistics.com>
10. Business Data Platform - <https://www.statista.com>
11. Federal State Statistic Service - <https://eng.gks.ru>
12. Khan Academy - <https://www.khanacademy.org/math/statistics-probability>