Belarus State Economic University Educational institution

BUSINESS STATISTICS

Syllabus for Master's Degree Program in the Specialization:
1-26 81 01 Business Administration

2016

EXPLANATORY NOTE

Managerial decision-making at all levels - from the national or regional level, and to economic entities - is not possible without proper statistical software. Discipline "Business Statistics" is one of the special educational disciplines that form of training in the field of business administration.

The **subject** of discipline - to disclose the nature and content of the statistical survey, giving a quantitative description of the massive socio-economic phenomena and processes that you can make well-founded decisions in conditions of uncertainty.

The **purpose** of the study "Business Statistics" - to form the future experts knowledge of the theoretical foundations of statistical science, a common methodological approach, as well as practical skills in statistical research in the field of business management in market conditions.

Tasks of the discipline: to familiarize undergraduates with existing regulations, reveals the essence of the content of statistical indicators to make the most important statistical and economic calculations with the help of statistical indicators, simulate and analyze using statistical indicators phenomena and processes occurring in the economy.

Requirements for a Master's academic competencies:
The specialist must:
- AC-1. Take the initiative, including in situations of risk, to take responsibility, to resolve problem situations;
- AC-2. To form the goals and objectives of the decision-making.
- AC-5. Use database software packages.
Requirements for social and personal competencies of a master:
The specialist must:
- SC-2. Possess skills formation and reasoning own judgment and professional positions.
- SC-3. Analyze and draw conclusions on the social, ethical, scientific and technological problems arising in professional activities.
- SC-4. Understand, describe and use in practice the basics of labor legislation and regulations.
- SC-8. Demonstrate initiative, including in situations of risk.
- SC-9. Provide a personal example of the positive impact on the participants and the professional activities in terms of compliance with rules and regulations of a healthy lifestyle, active life position.
- SC-10. Adapt to new situations, to implement lessons learned, opportunities.

A study of undergraduate discipline must:
know:
- The role of statistical techniques and solving practical problems in the field of modern economics and management;
- The main advantages and disadvantages of statistical techniques;
- Methods of preparing the raw data for subsequent analysis;
- Basic statistical treatment;

- General principles for the formulation and testing of statistical hypotheses;
- Basic approaches to decision-making under conditions of uncertainty;
- Prediction technology based on external factors and the creation of scenario forecasts;

be able to:
- Effective use of computer technology for the processing of statistical data;
- An analysis of formalized statistical problems arising;
- Justify the choice of the method and specific algorithms for processing of statistical data;
- Create and use regression models to analyze economic data;
- Identify and interpret statistically significant correlation in the data, use them for planning of economic activity;
- Create a statistically-based forecasts to evaluate the accuracy of predictive models;
- Interpret the results taking into account emerging statistical errors;

have the skills to:
- Analysis of statistical data, which will identify the main trends in the development of business, measure the rate of inflation, to analyze the state of the commodity markets, assess the competitiveness and market position of the organization, to make projections for the future;
- Assessment of specific situations and make decisions on strategic and tactical areas of financial and economic activities of a business entity.

Interdisciplinary communication:
The curriculum takes into account the requirements of the current educational standards in the specialty 1-26 81 01 "Business Administration" (the degree - Master of Business Administration) and in conjunction with other academic disciplines. Total hours in the discipline 170, have classroom - 60 hours, including 30 hours of lectures and 30 hours of practical training. Current attestation is an exam.

CONTENT OF EDUCATIONAL MATERIAL

1. Introduction into Business statistics

Definition of the term 'statistics'.
Statistical Methods
Functions of Statistics
Key Terms: Data, Population, Parameter, Sample, Variables (Independent and Dependent). Types Of Variables
Descriptive and Inferential statistics
Data Sources

2. Organizing Data Graphical and Tabular

Numerical/Quantitative Data
Qualitative/Categorical Data
Frequency Distributions
Graphical Presentation of Qualitative Data
Organizing and Graphing Quantitative Data
Frequency Distributions
Process of Constructing a Frequency Table
Graphing Grouped Data
Ogive

3. Measures of location and dispersion. The mean values

Types of means
Measures of location for ungrouped data: Arithmetic mean
Measures of location for ungrouped data: Harmonic mean
Measures of location for ungrouped data: Geometric mean
Measures of location for ungrouped data: Median
Measures of location for ungrouped data: Mode
Measures of location for grouped data: Arithmetic mean
Measures of location for grouped data: Harmonic mean
Measures of location for grouped data: Geometric mean
Measures of location for grouped data: Median
Measures of location for grouped data: Mode

4. Measures of location and dispersion. Measures of Variation

Measures of dispersion for ungrouped data
Measures of Variability: Range, Variance, Standard Deviation, Coefficient of the Variation
Measures of dispersion for ungrouped data
Measures of dispersion for grouped data

Mean and variance of the alternative feature

5. ANOVA - Analysis of Variance

Analysis of Variance (ANOVA)
Partitioning the Variation
One-Factor ANOVA. One-Way Analysis of Variance
F- Statistic. The Tukey-Kramer Procedure.
Two-way ANOVA.
The empirical correlation ratio, the coefficient of determination

6. Hypothesis testing

Statistical hypothesis
The null hypothesis (direct) and the alternative hypothesis (return)
Level of significance
Steps of a hypothesis test
Determine the critical value
Hypothesis testing for Population Mean
Hypothesis test for Population Proportion
Hypothesis testing for Population Variance

7. Sampling in Research Methodology

What is sampling. Types of Samples
Sampling methods in qualitative and quantitative research
Probability (Random) Samples: Simple random sample, Systematic random sample, Stratified random sample, Cluster sample, etc.
Non-Probability Samples: Convenience sample, Purposive sample, Quota, Snowball, etc.
Confidence Interval Estimation
Confidence Interval for μ (σ Known)
Confidence Interval for μ (σ Unknown)
 Confidence Intervals for the Population Proportion, p
Determining Sample Size For Mean and Proportion. Sampling Error
Confidence Interval for Population Total Amount
Confidence Interval for Total Difference
Stratified Random Sampling
Cluster sampling
Hypothesis testing for Population Mean
Hypothesis test for Population Proportion
Hypothesis testing for Population Variance

8. Simple Linear Regression

Regression analysis
Simple linear regression model
Finding the least squares equation
Interpretation of the slope and the intercept
Measuring the relationship: coefficient of elasticity
Approximation error
Measures of variation. Coefficient of determination.
The simplest methods to identify relationships
Standard error of estimate
Residual analysis
Measuring autocorrelation: the Durbin-Watson Statistic

9. Time Series Forecasting

Indicators of time-series
Average indicators of time-series
Time-series components
Methods of seasonal variation
Moving average method
Exponential smoothing
Types of Forecasts
Linear Regression
Trend-Based Forecasting

10. Index Numbers

Characteristics of index number.
Classification of index numbers
Simple index
Weighted aggregate index. Paasche's method and Laspeyres's method
Weighted average of price relative: Weighted average arithmetic of price relative and
Weighted Harmonic average of price relative
Chain index numbers
Factor indexes (multifactor models)
Two-factor models
The use of the index method in the analysis of the mean values
 Simple average method

EDUCATIONAL AND METHODICAL MAP

№	Chapter Title	The number of class hours						Other *	The form of knowledge control
		Lectures	Practical lessons	Seminars	Laboratory classes	Hours for independent work			
						lecture	practical		
1	**Introduction into Business statistics**	2	1					[3], [4], [5], [6], [8], [10], [11], [12], [13]	Questions
2	**Organizing Data Graphical and Tabular**	2	1					[3], [4], [5], [6], [8], [10], [11], [12], [13]	Questions Problem solving
3	**Measures of location and dispersion Part 1 - The mean values**	2	2					[3], [4], [5], [6], [8], [10], [11], [12], [13]	Questions Problem solving
4	**Measures of location and dispersion Part 2 - Measures of Variation**	2	3					[3], [4], [5], [6], [7], [8], [10], [11], [12], [13]	Questions Problem solving
5	**ANOVA - Analysis of Variance**	2	2					[1], [2], [5], [4], [6], [7], [8], [9], [10], [12], [13]	Questions Problem solving
6	**Hypothesis testing**	2	3					[1], [2], [3], [4], [6], [7], [8], [10], [11], [13]	Questions Problem solving
7	**Sampling in Research Methodology**	4	4					[1], [2], [3], [4], [6], [10], [13]	Questions Problem solving
8	**Simple Linear Regression**	4	4					[1], [2], [3], [4], [8], [14], [15]	Questions Problem solving
9	**Time Series Forecasting**	4	4					[4], [8], [14], [15]	Questions Problem solving
10	**Index Numbers**	6	6					[4], [8], [14], [15]	Questions Problem solving
	Total	30	30						

ADDITIONS AND CHANGES IN TRAINING PROGRAMS
IN 2016-2017 ACADEMIC YEAR

№	Additions And Changes	Basis

The curriculum is reviewed and approved at a meeting of the Department Protocol № _____ 2016

Head of Department
Doctor of Economic Sciences,
Associate Professor   _____   **Н.В. Агабекова**
         (signature)

APPROVED
Dean of the department
PhD in Economics   _____   _____
         (signature)

PROTOCOL FOR RECONCILIATION OF THE TRAINING PROGRAM WITH OTHER DISCIPLINES

Concordance is carried out with the discipline	The department	Proposal to change the content of the program	The decision of the department that has developed the training program (Date and protocol number if there are proposals to change)
Business-communications			

INFORMATION-METHODICAL PART

Guidelines on the organization of independent work of students in the academic discipline of "Business Statistics"

Self-study is an important step in the acquisition of knowledge of the discipline

Budget time for independent work rekomenduetsyav average 2-2.5 hours on 2 class hours.

The main areas of students' independent work are:

- A detailed introduction to the program of the discipline originally;

- Familiarization with the list of recommended books on the subject as a whole and its divisions, the availability of information in the library and other available sources, the study of relevant literature on the subject, the selection of secondary literature;

- The study and expansion of teacher lecture material at the expense of special literature, consultations;

- Preparation for practical exercises on a specially designed plans for the study of basic and additional literature;

- Preparation for implementation of diagnostic monitoring forms (survey, tests, examinations, etc.);

- Exam preparation.

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