Educational Establishment
Belarus State Economic University

APPROVED
Rector of the educational establishment
"Belarus State Economic University"
_____ V.N.Shimov
"26" ____04____ 2017
Registration № УД 3128-17/уч.

INTERNATIONAL BUSINESS-ANALYTICS

Course program for Master's Degree
1-25 81 03 World Economy

2017

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RECOMMENDED FOR APPROVAL:

World Economy Department, Belarus State Economic University Protocol № 10, 09.03.2017;

Scientific and Methodological Council of the Belarus State Economic University (Protocol № 4. 14.09.2017)

Responsible for issue: Y. Vashkevich

COURSE INTRODUCTION

The International Business-Analytics course equips students with insight about how international business intelligence and analytics contributes to business transformation and growth. It places a special focus on the issues of data visualization and interpretation. The course introduces key concepts, tools, and techniques of descriptive and predictive data-analysis. It also provides an introduction to data-mining and text-mining techniques, as well as risk assessment approaches.

The purpose of the course is to equip students with knowledge, tools and skills to analyze, visualize and present the results of data mining for business environment assessment and successful managerial decisions.

The aims of the module:

- to develop students' capacity to work with international business data and intelligence;
- to build students' skills in conducting statistical analysis of business-data;
- to give students hands-on experience in visualizing raw data and presenting final analytical results;
- to develop students' skills in working with various sources of data, including big data and text data.
- to help students learn how to use forecasting and risk assessment techniques.

On completion of this course, Master's Degree students should

know:

- basic concepts and methods of business-statistics and analytics;
- descriptive statistics techniques;
- key models of predictive analytics and data-mining;

be able to:

1. Work with various sources of business-data, including international databases;
2. Differentiate various data types and data characteristics;
3. Recognize and interpret patterns of data distribution;
4. Use alternative techniques and tools of business data visualization;
5. Perform effective data queries;
6. Apply discrete and continuous probability distributions to various business problems;
7. Perform test of hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases;
8. Compute and interpret the results of bivariate and multivariate regression and correlation analysis.
9. Create economic forecasts within integrated global macro models.
10. Understand and apply the most current data mining techniques and applications such as clustering algorithms, Kohonen clustering, text mining;
11. To perform quantitative risk analysis by using Monte Carlo simulation.

The International Business-Analytics course is aimed to develop the following **academic skills**:

- to assimilate and critically analyze data from an appropriate range of sources;
- to understand and use tools and techniques of quantitative research;
- to deploy theoretical arguments and apply them to empirical case studies.

Interdisciplinary relationships. The International Business-Analytics course builds on previous courses in Microeconomics, International Economics, Statistics, Econometrics. It implies familiarity with a number of basic concepts and models studied within Calculus and Economics courses.

Total student study time

(full-time form of study) – 66 hours, including 30 in-class hours: lectures – 24 hours, seminars – 6 hours.

(part-time form of study) – 66 hours, including 16 in-class hours: lectures – 12 hours, seminars – 4 hours.

The form of knowledge control – pass-test.

SYLLABUS PLAN

Topic No.	Topic Name	Hours	
		lectures	seminars
Topic 1	**Introduction to International Business-Analytics**	2	
Topic 2	**Data Types and Sources of International Business Intelligence**	2	
Topic 3	**Data Visualization**	4	2
Topic 4	**Data Exploration Techniques**	2	
Topic 5	**Statistical Analysis of Random Variables: Business Applications**	6	
Topic 6	**Regression Analysis and Time Series in Economics**	2	2
Topic 7	**Forecasting Techniques in International Business**	2	2
Topic 8	**Data and Text Mining**	2	
Topic 9	**Monte Carlo Simulation and Risk Analysis of Business Decisions**	2	
Total		**24**	**6**

CONTENTS

Multiple linear regression. Regression coefficients and the equation. Typical predictor error. Pitfalls and problems in multiple regression.

Trend-seasonal analysis. Trend and cyclic: the moving average. Seasonal index. Seasonal adjustment. Trends in economics.

Topic 7. Forecasting Techniques in International Business

Qualitative and judgmental forecasting: historical analogy, the Delphi method, indicators and indexes.

Statistical forecasting models.

Forecasting models for stationary time series: moving average models.

Forecasting models for time series with a linear trend.

Forecasting time series with seasonality.

OECD economic forecasting: National Institute's global econometric model.

Bottom-up forecasting, top-down financial forecasting

Topic 8. Data and Text Mining

Data exploration and reduction. Sampling, dirty data.

Cluster analysis: k-means clustering algorithm, clustering by nearest neighbors.

Kohonen maps.

Text mining preparation steps.

Text mining features

Topic 9. Monte Carlo Simulation and Risk Analysis of Business Decisions

Monte Carlo simulation: model inputs and outputs.

New-product development model.

Newsvendor model.

Overbooking model.

Educational and Methodological Course Outline
Full-Time Form of Study

Topic No.	Topic name, topic contents	Lectures	Seminars	Practical classes	Labar otry studie s	Managed (controlled) student independen t learning	Literature	Form of control
1	**Introduction to International Business-Analytics**	**2**					**1–15**	**Quizzes**
2	**Data Types and Sources of International Business Intelligence**	**2**					**1–15**	**Quizzes, assignments**
3	**Data Visualization**	**4**	**2**				**1–15**	**Quizzes, assignments**
4	**Data Exploration Techniques**	**2**					**1–15**	**Quizzes, problem solving**
5	**Statistical Analysis of Random Variables: Business Applications**	**6**					**1–15**	**Quizzes, problem solving**
6	**Regression Analysis and Time Series in Economics**	**2**	**2**				**1–15**	**Quizzes, problem solving**
7	**Forecasting Techniques in International Business**	**2**	**2**				**1–15**	**Quizzes, problem solving**
8	**Data and Text Mining**	**2**					**1–15**	**Quizzes, assignments**
9	**Monte Carlo Simulation and Risk Analysis of Business Decisions**	**2**					**1–15**	**Quizzes, problem solving**
Total		**24**	**6**					**Pass-Test**

Educational and Methodological Course Outline
Part-Time Form of Study

Topic No.	Topic name, topic contents	Lectures	Seminars	Practical classes	Laboratory studies	Managed (controlled) student independent learning	Literature	Form of control
1	**Introduction to International Business-Analytics**	**1**					**1–15**	**Quizzes**
2	**Data Types and Sources of International Business Intelligence**	**1**					**1–15**	**Quizzes, assignments**
3	**Data Visualization**	**2**					**1–15**	**Quizzes, assignments**
4	**Data Exploration Techniques**	**1**					**1–15**	**Quizzes, problem solving**
5	**Statistical Analysis of Random Variables: Business Applications**	**3**					**1–15**	**Quizzes, problem solving**
6	**Regression Analysis and Time Series in Economics**	**1**	**2**				**1–15**	**Quizzes, problem solving**
7	**Forecasting Techniques in International Business**	**1**	**2**				**1–15**	**Quizzes, problem solving**
8	**Data and Text Mining**	**1**					**1–15**	**Quizzes, assignments**
9	**Monte Carlo Simulation and Risk Analysis of Business Decisions**	**1**					**1–15**	**Quizzes, problem solving**
Total		**12**	**4**					**Pass-Test**

INFORMATION AND METHODOLOGICAL PART

Required reading

1. Abbott, D. Applied Predictive Analytics: Principles and Techniques for the Professional Data Analyst / Dean Abbott. – Wiley, 2014. – 427 p.
2. Bramer, M. Principles of Data Mining / Max Bramer. – 3rd ed. – London: Springer, 2016. – 530 p.
3. Evans, J. Business Analytics / James Evans.– 2nd ed. – Pearson, 2017. – 65 p.
4. Siegel, A.F. Practical Business Statistics / Andrew F. Siegel. – 7th ed. – Elsevier Inc., 2016. – 642 p.
5. Siegel, E. Predictive Analytics: the Power to Predict Who Will Click, Buy, Lie, or Die / Eric Siegel. – Wiley, 2013. – 338 p.

Additional reading

6. Agresti, A., Finlay, B. Statistical Methods for the Social Sciences / Alan Agresti, Barbara Finlay. – 4th ed. – Pearson, 2014. – 564 p.
7. Doane, D.P. Applied statistics in business and economics / David P. Doane, Lori E. Seward. – 3rd ed. – McGraw-Hill, 2011. – 843 p.
8. Guide to Economic Indicators: Making Sense of Economics.– 6th ed. – The Economist Newspaper Ltd., 2006. – 257 p.
9. Kokoska, S. Introductory Statistics: A Problem-Solving Approach / Stephen Kokoska. – 2nd ed. – Freeman and Co., 2015. – 890 p.
10. Making Data Meaningful: (Part I) A guide to writing stories about numbers. – United Nations Economic Commission for Europe, 2009. – 28 p.
11. Making Data Meaningful: (Part II) A guide to presenting statistics. – United Nations Economic Commission for Europe, 2009. – 58 p.
12. Phillips, T. Data-driven business: use real-life numbers to improve your business by 352% / Tim Phillips. – Oxford: Infinite Ideas, 2016. – 159 p.
13. Yamarone, R. The Economic Indicator Handbook: How to Evaluate Economic Trends to Maximize Profits and Minimize Losses / Richard Yamarone. – Hoboken (USA): John Wiley & Sons, Inc., 2017. – 340 p.
14. Паклин, Н.Б., Орешков, В.И. Бизнес-аналитика: от данных к знаниям: учеб.пособие / Н.Б. Паклин, В.И. Орешков. – СПб.: Питер, 2013. – 704 с.
15. Петрунин, Ю.Ю. Информационные технологии анализа данных. Data analysis: учебное пособие / Ю.Ю. Петрунин. – М.: КДУ, 2008. – 292 с.

SYLLABUS NEGOTIATION PROTOCOL

Study discipline for coordination	Department	Suggestions of the alterations in the study program contests	Decision taken by the Department regarding the study program (data and protocol number)
Microeconomics (advanced level)	Economic Theory	The content of the training syllabus of higher educational establishment is agreed. No changes are required.	Protocol № 10 dated 09.03.2017