MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

SIMON KUZNETS KHARKIV NATIONAL UNIVERSITY OF ECONOMICS

"APPROVED"
Depute Head
(vice-rector for scientific and pedagogical work)

M. V. Afanasiev

MODERN METHODS OF BUSINESS ANALYTICS

syllabus for students

Area of Education	**all**
Specialty	**all**
Educational level	**second (master's)**
Educational program	**all**

Type of discipline	**selective**
Language of teaching, training and evaluation	**foreign (English)**

Head of the department of statistics
and economic forecasting — O. Rayevnyeva

Kharkiv
S. Kuznets KhNEU
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APPROVED
at a meeting of the Department of Statistics and Economic Forecasting
Protocol № 1 on 02.09.2019

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Letter of renewal and re-approval of the academic discipline

Academic year	Date of the meeting of the department - developer of syllabus	Protocol number	The signature of the head of the department
2019/2020	02.09.2019	1	

1. Introduction

Annotation of the discipline:

Today, when making any business decisions, the role of intuition diminishes and the importance of business analytics is growing, whose effective functioning contributes to the implementation of the company's strategy. This leads to the search for effective forms of interaction between business strategies and business analytics at enterprises, which enables them to use data for successful development, transform them into useful information, form new knowledge about the peculiarities of business processes and the business environment on the basis of information technologies. Modern business analytics tools are quite diverse and flexible, and their choice is determined by the company's strategy, which changes the use of data from the enterprise by data management, which they receive from analysts. Increasingly, the introduction of business intelligence systems at the enterprise becomes a decisive factor in its existence on the market, and for client-oriented enterprises, they are simply necessary.

The rapid growth of the amount of available information used in the decision-making process, the increased need for operational access to it, the expansion of the number of data sources, and the need to provide access to them by operational staff have become the main reasons for a sharp increase in interest in business intelligence.

An acceptable level for an enterprise should be chosen on the basis of analysis of the strategic perspective of enterprise development. After all, in some types of economic activity, business analytics is not a prerequisite for success, while in others it is a major competitive advantage. In any case, successful business analytics processes should have a well-defined structure that always begins with defining an information strategy that is derived from the goals of the enterprise strategy and is geared towards generating forward-looking information as the main source of analytical competition.

The educational discipline "Modern methods of business analytics" will allow to effectively using modern information and economic methods and models of business process research, to determine the perspective directions of their development based on the forecasting of the relevant indicators, to visualize the results of calculations, using modern software products and online technologies.

The subject of the discipline is the subject of business, which carries out business processes in the current operating conditions.

The subject of the discipline is modern methods, models and information technologies for the study of business processes and behavior of socio-economic systems.

The purpose of the discipline: the acquisition by future specialists in the economic and analytical sphere of competence in the construction of economic models and the use of modern information technology to evaluate, analyze and predict the business processes of socio-economic systems, which operate in a high level of uncertainty and risk both national and world market economy.

Course	1M	
Semester	2	
Number of ECTS credits	5	
Audit lessons	lectures	20
	laboratory	20
Independent work		110
Form of final control	**test**	

Structural-logical scheme of studying the discipline:

Previous disciplines	The following disciplines
Statistics	All disciplines of professional and practical cycle
Computer Science	
Political Economy	
Higher mathematics	
Microeconomics Macroeconomics	Writing course papers, consulting projects

2. Competence and outcomes of studying in a discipline:

Competence	Results of studying
Ability to acquire theoretical knowledge in conducting business process analysis based on the use of modern software packages and gaining the skills of forming an informational study area for making managerial decisions.	Conduct a preliminary analysis of the business environment in order to form the information space of the study
	Ability to evaluate the business environment with modern analysis tools and information technologies
	Use international indexes when analyzing and evaluating business processes
Ability to model business processes and develop managerial decisions according to the real situation	Apply methods of forecasting business processes, perform calculations of model parameters and verify compliance with real processes in the business environment based on the use of information technology
	Use panel data to analyze the business environment in the current management environment
	Ability to detect structural changes in economic processes
Ability to formulate managerial decisions about the behavior of the enterprise based on the use of cloud technologies	Understanding the essence of solvable business tasks by means of cloud technologies
	Ability to create scenarios for using cloud solutions when modeling the behavior of business processes
	Ability to visualize the resulting business results in the formation of effective management decisions to correct the behavior scenario of the enterprise
Ability to use modern information technologies and modern methods of analytics of business processes and their intellectual visualization.	Ability to use econometric forecasting methods, international indexes, cloud analysis for business environment assessment and analysis
	Ability to use intellectual rendering of business decisions.

3. Program of the academic discipline

Content module 1. Basics of business analysis

Theme 1. Methodological basis of business process analysis

1.1. The essence of the business process. Functions and tasks of business process analysis.

Approaches to defining the concept of business process. Essence, content of business processes of business entities in the current environment of changing environment.

1.2. Classification of types of analysis of business processes.

Structural diagram of business processes. Use of methods, models and technologies for analyzing business processes in accordance with the stated purpose. Classification of business processes for ENAPS. Classification of business processes by features and types of processes. Classification of business processes at the enterprise by appointment.

1.3. Toolkit for business process research.

Types of analysis of business processes on the basis of classification. Structural-hierarchical model of business process analysis in modern economic conditions.

Laboratory work on the theme 1. Formation of the information space of the study

Theme 2. Assessment of the business environment on the basis of international indexes

2.1. The essence of the assessment and analysis of the macro business environment

Purpose, content and methodical features of external business environment analysis. Determination of the main indicators of the macro environment. Determination of the factors of influence on the assessment of the macro business environment.

2.2. International indices as a modern means of analyzing the attractiveness of international business.

Concept index, index method. Elements of which the index is composed. Classification of types of index. The essence of international indices. Grouping of international indexes by classification. International ratings when assessing the financial situation of the business environment.

Laboratory work on the theme 2. "International indicators of business environment analysis"

Content module 2. Data visualization and cloud service tools for business analysis

Theme 3. Forecasting trends of business environment development

3.1. Simple forecasting methods

Forecasting as a method of predicting socio-economic processes (approaches to solving predictive problems, ways of forecasting development, forms of prediction, prediction functions). Prediction as a management function. Classification of forecasts. Typology of forecasting methods. Stages of statistical forecasting process.

3.2. Features of the use of econometric forecasting methods

Basic stages of building econometric prediction models. Classification of economic

and mathematical models of forecasting on various grounds. Basis requirements for the construction of economic and mathematical models of forecasting.

3.3. Methods of adaptive forecasting.

The concept of anti-aliasing. Common smoothing methods: simple smoothing methods, exponential smoothing, adaptive smoothing. Concept of adaptive smoothing models. Smoothing by Brown, Holt and Winters.

Laboratory work on the theme 3. "Simulation of business processes in modern conditions of management".

Theme 4. Investigation of spatial-temporal aggregates

4.1. Panel data

The concept of panel data and their application in the economy. Types of panel data: balanced and unbalanced panels. Simple panel data model, combined regression model. Models of complex errors. Individual and fixed effects. Advantages and disadvantages of using panel data.

4.2. Formation of homogeneous aggregates by means of cluster analysis.

Areas of use of cluster analysis. Classification and its types. Comparison of clustering and classification. Stages of cluster analysis. Advantages and limitations of cluster analysis. The concept of the cluster method. Methods of cluster analysis - hierarchical and non-hierarchical methods of cauterization. Hierarchically sgm. and divisimic methods. Rules for merging into a cluster. Medium method, PAM method. Checking the quality of clustering.

4.3. Methods of Detecting Structural Changes in Economic Processes

The essence of structural changes in the study of economic processes. Classification of methods in the study of the structure of business processes. Stages of the use of structural analysis in the study of business processes

Laboratory work on the theme 4. "Formation of homogeneous sets of business processes"

Theme 5. Cloud service tools for business analysis

5.1. Modern means of data visualization, their classification

Information concept and information society. Stages of formation of information space of business process. Fundamentals of data visualization and modern visualization tools. Infodesign.

5.2. Essence of cloud analysis of business processes

Functions, tasks of cloud analysis. Stages of cloud analysis of business processes. Prospects of using cloud technologies in business process analysis Cloud solutions: opportunities, benefits, risks.

5.3. Scripts for using cloud solutions. Intellectual visualization of business decisions.

Cloud for Business: A Review of Effective Uses. Economic efficiency of the cloud-computing model. The essence of using intellectual imaging when making business decisions.

Laboratory work on the theme 5. "Business analysis by means of cloud technologies"

4. The order of assessment of the results of training

The system of assessment of the formed competences of students takes into account the types of classes, which according to the curriculum of the discipline include lectures, laboratory classes, as well as the performance of independent work.

Assessment of students' competences is made using a 100-point cumulative system.

In accordance with the Provisional Regulation "On the procedure for evaluating the learning outcomes of students on the cumulative scoring system" S. Kuznets, control

measures include:

current control, which is carried out during the semester during the lectures and laboratory classes and is estimated by the sum of points scored;

final / semester control, conducted in the form of a semester exam, according to the schedule of the educational process.

The system of assessment of students' knowledge, skills and competences provides assessment of all forms of conducting classes. Assessment of the student's knowledge is carried out on a cumulative 100-point system.

The system of assessment of the formed competences of students takes into account the types of classes, which according to the curriculum of the discipline include lectures, laboratory classes, as well as the performance of independent work.

Assessment of students' competences is made using a 100-point cumulative system. In accordance with the Provisional Regulation "On the procedure for evaluating the learning outcomes of students on the cumulative scoring system" S. Kuznets, control measures include:

current control, which is carried out during the semester during lectures, practicals, seminars and is estimated by the sum of points. Current control of this discipline is carried out in the following forms:

active work in lectures;

protection of laboratory works;

conducting ongoing testing;

protection of essay with presentation of material;

carrying out modular written control work;

individual research task.

Assessment of the student's knowledge is carried out on a cumulative 100-point system.

Criteria for current assessment of students' knowledge:

Lectures (1 point):

0.5 - attendance at lectures;

0.5 - active participation in the discussion of the lecture.

Laboratory work (5 points):

1 - presence at the laboratory;

2 - active participation in solving laboratory problems;

4 - laboratory work is done correctly;

5 - laboratory work is done correctly and protection of the report according to the schedule of the educational process.

Tests (2 points):

25% correct answers - 0.5 points;

50% correct answers - 1 point;

75% correct answers - 1.5 points;

100% correct answers - 2 points.

Essay with presentation of the material (5 points):

5 - the content and structure of the completed essay are consistent with the purpose of the study, the presentation of the research results is offered and analytical explanations and conclusions are given regarding the tasks; conducted a comprehensive study of the object of study;

4 - the content and structure of the completed essay are consistent with the purpose of the study, the presentation of the research results is offered and analytical explanations

and conclusions are given regarding the tasks; sufficient research has been conducted on the state of the research object, according to the purpose of the essay;

3 - the content and structure of the completed essay are consistent with the purpose of the study, the presentation of the research results is offered and analytical explanations and conclusions are given regarding the tasks; sufficient research has been conducted on the status of the research object according to the purpose of the essay, but the set of indicators by prospects that influence business development is not correctly defined;

0 - the content and structure of the completed essay are not relevant to the purpose of the study or the essay is missing.

Written test (10 points):

10 - all problems are solved correctly, reasonable conclusions are made regarding the analyzed situation;

9 - all problems are solved correctly, but the student made some inaccuracies in formulating economic conclusions;

7 - all tasks are solved correctly, but the student did not make complete economic conclusions;

6 - all tasks are solved, but the student made minor mistakes in solving problems and formulating conclusions;

5 - all tasks are solved, but the student has made significant mistakes in their solution and formulation of conclusions;

0 - student failed to attend module test.

INDZ (20 points):

1-3 points - the information space of the study is formed only;

4-6 points - the information base is correctly formed, the substantiation and rational use of modern methods of business analytics and data visualization are provided;

7-9 points - the information base is correctly formed, justification and rational use of statistical methods are provided, but some inaccuracies have elements of visualization of the obtained results;

10-12 points - the information base is correctly formed, substantiation and rational use of statistical methods and indicators are provided, but there is no economic and legal interpretation of the analysis results;

13 points - the analytical report was prepared methodologically correct, the structure was maintained, the information base was correctly formed, the rationale and rational use of statistical methods and visualization of the obtained results were provided, the economic and legal interpretation of the analysis results is correct.

final / semester control, taken in the form of credit, according to the schedule of the educational process.

The system of assessment of students' knowledge, skills and competences provides assessment of all forms of conducting classes. Assessment of the student's knowledge is carried out on a cumulative 100-point system.

A student should be considered as certified if the sum of the points obtained on the results of the final / semester examination is equal to or exceeds 60.

Distribution of points for a week

Themes of the content module			Lectures	Laboratory sessions	The written test	Essay	Control work	INDS	Total
Content module 1. Basics of business analysis	**Theme 1.** Methodological basis of business process analysis	1 week	-	-	-	-	-		-
		2 week	1	-	-	-	-		1
		3 week	-	5	2	-	-		7
	Theme 2. Assessment of the business environment on the basis of international indexes	4 week	1	-	-	-	-		1
		5 week	-	-	-	5	-		5
		6 week	1	5	2	-	-		8
Content module 2. Methods of estimation and forecasting of modern business processes	**Theme 3.** Forecasting trends of business environment development	7 week	-	-	-	-	-		4
		8 week	1	-	-	-	-		1
		9 week	1	5	2	-	10		18
	Theme 4. Investigation of spatial-temporal aggregates	10 week	1	-	-	-	-		1
		11 week	-	5	-		-		5
		12 week	1	-	-	-	-		1
		13 week	-	-	-	-	-		-
		14 week	1	5	2	-	-		8
	Theme 5. Cloud service tools for business analysis	15 week	-	-	-	5	-		5
		16 week	1	5	-	-			6
		17 week	1	-	2	-	10	20	33
	Total		10	30	10	10	20	20	100

5. Grading scale: national and ECTS

Assessment of the S. Kuznets KhNUE according to Economics scale	ECTS assessing scale		Assessment according to national scale
90-100	A	excellent performance	Excellent
82-89	B	above average	
74-81	C	work at all correct, but with a number of errors from	Good
64-73	D	not bad, but many drawbacks	Satisfactory
60-63	E	performance meets the minimum criteria	
35-59	FX	need to re-take	Unsatisfactory
1-34	F	repeat the discipline	

6. REFERENCES

6.1. Main

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3. Desamparados Blazquez, Josep Domenech Big Data sources and methods for social and economic analyses / Technological Forecasting and Social Change. – Volume 130. – 2018. - P. 99-

4. Haidar, J. I. (2015), "Impact of business regulatory reforms on economic growth", Journal of the Japanese and International Economies, Elsevier, vol. 26 (3), pp. 285–307, September.

5. Schwabish, Jonathan A. An Economist's Guide to Visualizing Data // Journal of Economic Perspectives—Volume 28, Number 1—Winter 2014—P. 209–234

6. Avraham Shtub, Reuven Karni (2010). ERP. The Dynamics of Supply Chain and Process Managemement

6.2. Additional

7. The Global Competitiveness Report 2014–2015. Insight Report: The World Economic Forum. [Electronic resource]. – Access mode: ttp://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014–15.pdf.

8. Haidar, J. I. (2015), "Impact of business regulatory reforms on economic growth", Journal of the Japanese and International Economies, Elsevier, vol. 26 (3), pp. 285–307, September.

6.3. Methodical materials

9. Guidelines to laboratory works on the academic discipline "Statistics" for full-time students of training direction 6.030601 "Management" of the specialization "Business Administration" and of training direction 6.140103 "Tourism" / compiled by O. Rayevnyeva, I. Serova, O. Bobkova et al. – Kh. : Publishing House of KhNUE, 2013. – 60 p.

6.4. Internet resources

10. Official site of the United Nations Statistics Division [Electronic resource]. - Access mode: http://unstats.un.org/unsd/default.htm

11. World Bank Official Website [Electronic resource]. - Access mode: https://www.vsemirnyjbank.org/

12. Official site of the Doing Business 2020 project [Electronic resource]. - Access mode: - https://doingbusiness.org