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

METHODS AND MODELS OF FORECASTING PROCESSES IN FOREIGN ECONOMIC ACTIVITY

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
2019

APPROVED
at a meeting of the Department of Statistics and Economic Forecasting
Protocol № 1 on 02.09.2019

Compiled by:
Rayevnyeva O., doctor of economic sciences, professor of the Department of Statistics and Economic Forecasting;
Brovko O., candidate of economic sciences, associate professor of the Department of Statistics and Economic Forecasting.

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:

The development of economic ties between countries, the rapid growth of the scale of the globalization process, increase the level of competition in the global market requires businesses to the permanent implementation of measures for the development of their foreign economic activities (FEA). The process of planning of activity of the enterprise limited, and is complicated by a number of objective and subjective reasons. First, the enterprise does not have full data about its current and future status and is unable to predict all changes that may occur in the operational environment. Even a modern enterprise with powerful information systems and have access to valuable sources of information are not able to completely eliminate uncertainty, and respectively, to plan their activities. Since uncertainty is an impossible, task due to the inability to exclude the influence of external factors, diversity nespithe interests and actions. The uncertainty is characterized by ambiguity used of opinions and expert evaluations, incompleteness and inaccuracy of data on the main parameters and conditions of object of forecasting. The biggest difficulty of forecasting foreign economic activity of enterprises and firms due to highly dynamic, multifactorial nature of its formation and difficult predictability of foreign economic relations. Efficiency and the probability of a successful implementation of foreign economic activities depends on many factors. Therefore, there is a need of forecasting and planning the implementation of FEA using methods economic and mathematical modeling. One of the most pressing challenges facing the leading companies engaged in foreign trade identification of promising strategies and tactics of enterprise in modern software products and online technology to improve the quality of management decisions. Simulation – the basic specific method that is used for analysis, determining trends of development of economic entities. This is especially important for those businesses and organizations engaged in foreign trade. The strategy and tactics of behavior in the markets of foreign countries is difficult structured problem that requires from managers the timely knowledge of development trends in the analyzed processes and forecasting the main indicators of their activities in foreign markets. The discipline "Methods and models of forecasting processes in foreign economic activity" will allow to effectively use the modeling methods of foreign economic processes, to build economic and mathematical model of economic processes, determine future consequences of foreign economic activity on the basis of the prediction of appropriate indicators, to implement the visualization of results of calculations using modern software and technology.

The object of the discipline is economic system, which carries out foreign trade activity and processes that reflect the main spheres of its activity.

The subject of discipline are methods and forecasting models of foreign economic processes and behavior of socio-economic systems.

The purpose of the discipline the acquisition of future specialists in the sphere of international activities of the competences regarding the construction and use of econometric models for evaluation, analysis and forecasting of complex socio-economic systems operating in conditions of high level of uncertainty and risk in both national and global 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
Higher mathematics	All disciplines of professional and practical cycle
Statistics	
Computer Science	
Economic theory	
Microeconomics	
Macroeconomics	

2. Competence and outcomes of studying in a discipline:

Competence	Results of studying
The ability to form an adequate system of statistical indicators as indicative space research.	To carry out an initial analysis of the information space research
	The ability to identify and handle anomalous values of methods and prediction models
	The ability to identify and handle anomalous values of methods and prediction models
The ability to develop an econometric model according to the real situation and analyze the adequacy of the models.	Implement adequate methods of evaluation of the economic situation, to carry out calculations of the parameters of the models and to check for compliance with the real processes in foreign economic activity
	Use appropriate criteria to evaluate the reliability of actual and predicted ratings
	The ability to choose adequate methods and models for forecasting in foreign trade activities
The ability to form management decisions about the conduct of an enterprise in international markets.	Understanding of the nature of tasks using the methods and models of forecasting
	Ability to modeling and forecasting of the relationships between processes and phenomena in the external economic activities of business entities
	The ability to rational use of the obtained prediction results in the formation of effective managerial decisions on adjustment of export-oriented enterprise behavior
The ability to use modern media & information technologies of processing and visualization of	Ability to use Excel, Statistics for processing large amounts of information regarding export-import activities of enterprises

large amounts of economic data.	The ability to use modern packages of information visualization.

3. Program of the academic discipline

Content module 1. The foundations of economic forecasting of systems behavior

Theme 1. Introduction to economic forecasting

1.1. Forecasting as a means of prediction of socio-economic processes
1.2. The system of economic forecasting and its elements
1.3. The principles and functions of economic forecasting
1.4. Classification of methods of economic forecasting
Laboratory work on theme 1. "The formation of information space research"

Theme 2. The series as a means of determining the trends of development of economic processes

2.1. The concept of a number of speakers, items. Comparing levels of a number of speakers
2.2. Requirements for statistical information. Pre-processing of empirical data
2.3. Average values of the levels of a number of speakers and their numerical characteristics
2.4. Analytical model of time series
Laboratory work on theme 2. "Investigation of regularities of development of foreign economic activity at the expense of statistical indicators."

Theme 3. The application features a simple forecasting methods

3.1. The notion of approximation. Simple methods of forecasting.
3.2. Method two extreme points. Method, medium group of points. Forecasting based on growth rate
Laboratory work on theme 3. "Simple methods of forecasting trends in the development of enterprises and events".

Content module 2. Methods of forecasting of economic processes

Theme 4. Forecasting foreign economic processes based on the use of econometric models

4.1. The concept of the regression equation. The major limitations of regression models
4.2. Building a univariate regression model. Assessment of statistical significance of parameters and model adequacy
4.3. The construction of multivariate forecasting models.
Laboratory work on t*heme*4. "Building bigtoponline univariate and regression models"

Theme 5. The use of specific forecasting models flow of foreign economic processes

5.1. The study of the seasonal components of the economic process using decomposition of time series
5.2. Building prediction models using qualitative variables
Laboratory work on theme 5. "Prediction of phenomena and processes taking into account quantitative and qualitative characteristics"

Theme 6. Adaptive forecasting methods

6.1. Features short-term forecasting techniques

6.2. Algorithmic methods of time series smoothing.

6.3. Forecasting using moving averages. Method Brown. Holt's Method

Laboratory work on theme 6. "Building short-term forecasting techniques"

Theme 7. Modeling and forecasting multivariate processes

7.1. The essence of cluster analysis.

7.2. Standardization and regulation. The concept of distance.

7.3. The use of methods of cluster analysis for spatial research in the foreign economic activities of enterprises

Laboratory work on theme 7. "The use of cluster analysis for the study of spatial economic processes."

4. The order of assessment of the results of training

The system of evaluation of the developed competencies of students takes into account the types of occupations that, according to the curriculum program, include lectures, laboratory classes, and independent work.

Assessment of the developed competencies among students is based on a 100-point accumulation system.

In accordance with the Provisional Regulations "On the Procedure for Assessing the Results of Students' Learning Based on the Accumulated Bulletin-Rating System" S. Kuznets KhNUE, control measures include current and final control.

Current control, carried out during the semester during lectures and laboratory classes, and estimated by the sum of the points scored (maximum amount - 100 points).

Current control of this discipline is carried out

active work in lectures;

protection of laboratory works;

protection of essay with presentation of material;

conducting ongoing testing;

carrying out modular written control work.

Lectures (2 points):

1 - attendance at lectures;

1 - active participation in the discussion of the lecture.

Laboratory work (4 points):

1 - presence at the laboratory;

2 - active participation in solving laboratory problems;

3 - laboratory work is done correctly;

4 - 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 material (9 points):

9 - 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;

7 - 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;

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; 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.

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

The student should be considered certified if the sum of the points earned on the results of the final / semester test of success is equal to or greater than 60. In case of receiving less than 60 points, the student must pass the examination after the end of the examination session in the deadline set by the dean of the faculty, but not later than two weeks after the beginning of the semester.

Distribution of points for a week

Themes of the content module			**Lectures**	**Laboratory sessions**	**The written test**	**Essay**	**Homeworks**	**Control work**
1. The foundations of economic forecasting of systems	**Theme 1.** Introduction to economic forecasting	1 week	2					2
	Theme 2. The series as a means of determining the trends of development of economic processes	2 week	2	4	2			8

	Theme 3. The application features a simple forecasting methods	3 week	2	4	2			8
Content module 2. Methods of forecasting of economic processes	**Theme 4.** Forecasting foreign economic processes based on the use of econometric models	4 week	2	4	2	9		17
		5 week	2	4			10	16
	Theme 5. The use of specific forecasting models flow of foreign economic processes	6 week	2		2			4
	Theme 6. Adaptive forecasting methods	7 week	2	4	2			8
		8 week	2	4				6
	Theme 7. Modeling and forecasting multivariate processes	9 week	2		2	9		13
		10 week	2	4	2		10	18
	Total		20	28	14	18	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

1. Allen, P. G., and Fildes, R. A. (2000). Econometric forecasting strategies and techniques. Forthcoming, J. S. Armstrong, (ed.) Principles of Forecasting, Kluwer Academic Press, USA.

2. Baltagi, B.H., Fingleton, B. and Pirotte, A. (2014) Estimating and forecasting with a dynamic spatial panel data model, Oxford Bulletin of Economics and Statistics, 76(1), 112-138

3. Bårdsen, G., Ø. Eitrheim, E. S. Jansen, and R. Nymoen (2005) The Econometrics of Macroeconomic Modelling, Oxford University Press, Oxford.

4. Chevillon, G., and D. F. Hendry (2005) “Non-parametric Direct Multi-step Estimation for Forecasting Economic Processes”, International Journal of Forecasting, 21, 2, 201—218

5. Clements, M. P., and D. F. Hendry (1998) Forecasting Economic Time Series, Cambridge University Press, Cambridge.

6. Hendry, D. F., S. Johansen, and C. Santos (2008) “Automatic Selection of Indicators in a Fully Saturated Regression”, Computational Statistics, 23, 2, 317—335, 337—339.

7. Kopoin, A., Moran, K. and Paré, J.P. (2013) Forecasting regional GDP with factor models: How useful are national and international data? Economics Letters, 121(2), 267-270.

8. Mayor, M., López, A.J. and Pérez, R. (2007) Forecasting regional employment with shiftshare and ARIMA modelling, Regional Studies, 41(4), 543-551

6.2. Additional

9. C.W.J. (ed.) (1990). Modeling Economic Series. Oxford: Clarendon Press. Whitley, J.D. (1994). A Course in Macroeconomic Modeling and Forecasting. London: Harvester Wheatsheaf.

10. Clements, M. P., and Hendry, D. F. (1995). Forecasting in cointegrated systems. Journal of Applied Econometrics, 10, 127–146

11. Granger C. W.J., Newbold P. Forecasting economic time series. 2nd ed. - N.Y.: Academic Press, 1986.- 324 p.

12. Miller, P. J. (1978) “Forecasting with Econometric Methods: A Comment”, Journal of Business, 51, 4, 579—586.

6.3. Internet resources

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

14. Official site of the State Statistics Service of Ukraine [Electronic resource]. - Access mode: www.ukrstat.gov.ua.