


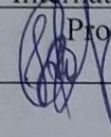
**NATIONAL UNIVERSITY
OF LIFE AND ENVIRONMENTAL SCIENCES OF UKRAINE**

Department of Statistics and Economic Analysis

"CONFIRMED"
Dean of the Economic faculty,
 Anatoliy Dibrova
" 30 " 04 2023



"APPROVED"
at the meeting of the Department
of Statistics and Economic Analysis
Protocol № 12 from "28" April 2023
Head of the Department
 Inna Lazaryshyna

"REVIEWED"
Program Coordinator "International Economics"
 Program Coordinator
Yulia Bilyak

PROGRAM OF THE COURSE

"ECONOMETRICS"

Specialization 072 "Finance, banking, insurance and stock market"
Educational program "Corporate finance"
Economic Faculty
Developers: Oksana Makarchuk, Associate Professor of the Department of Statistics
and Economic Analysis, PhD in Economics

Kyiv – 2023

1. Description of the discipline ECONOMETRICS

Field of knowledge, specialization, educational program, educational degree		
Educational degree	<i>bachelor</i> <i>(Bachelor's, Master's)</i>	
Specialization	<i>072 “Finance, banking, insurance and stock market”</i> <i>Code and Name of specialization</i>	
Educational program	<i>Corporate finance</i> <i>Name of program</i>	
Characteristics of the course		
Type	Compulsory	
Total number of hours	120	
Number of ECTS credits	4	
Number of content modules	2	
Course project (work) (if applicable)	-	
Form of assessment	<i>Exam</i>	
Indicators of the course for full-time and part-time forms of study		
	Full-time form of study	Part-time form of study
Course (year of study)	2	
Semester	4	
Lecture classes	30 hr.	hr.
Practical, seminar classes	30 hr.	hr.
Laboratory classes	hr.	hr.
Self-study	60 hr.	hr.
Individual assignments	hr.	hr.
Number of weekly classroom hours for the full-time form of study	4 hr.	

2. Purpose, objectives, and competencies of the course

The purpose of econometrics is acquisition by the future specialists knowledge of the methods of construction of economically-mathematical models on macro and micro levels, abilities to utilize the proper mathematical vehicle in the decision of economic and administrative tasks and development of creative and analytical skills for

economists and managers from a mathematical modelling, including usage of the personal computer for conducting of researches.

Criteria of estimation of student's knowledge. For objective determination of quality of knowledge of students the module-rating system of evaluation of knowledge is utilised. The evaluation system is given more flexible and more objective than previous, that is instrumental in systematic and active independent work of students during all of period of studies, provides a healthy competition between students in studies, instrumental in an exposure and development of capabilities of students. Current control of knowledge of students and mastering by them programmatic material a teacher which conducts employment from a course carries out. He is carried out in the process of conducting of practical and individual employments. During practical employments such controls are used: verbal questioning from themes, certain plans practical employments, conducting of test control, by the evaluation of implementation of individual calculation tasks on the proper subject. Final control is carried out as examination (to the test) at the end of semester. At establishment of estimation effectiveness of current control, mastering of educational material is taken into account. The evaluation of results of capture of educational material a student takes a place taking into account the shown knowledge and carried out it is differentiated in accordance with the accepted Statute about the credit-module system of studies.

Learning course of Econometrics, students should know:

- essence of econometric modeling and its stages;
- methods of testing of economic information;
- methods of evaluation parameters of econometrical model taking into account the features of concrete economic information;
- methods of evaluation of authenticity of models and its parameters;
- methods of evaluation of estimation properties of model;
- methods of econometric prediction taking into account the features of econometrical models.

Students must be able:

- to identify variable models;
- to specify a model;
- to estimate the parameters of econometrical model in time of:
 - a) normally distributed tailings of model;
 - b) heteroskedasticity;
 - c) multicollinearity of explaining variables;
 - d) presence of dependence of tailings with explaining variables;
- to determine prognosis properties of model;
- to check up authenticity of model and its parameters;
- to execute a point and interval prognosis on the basis of different econometrical models;
- to determine basic economic descriptions of intercommunication and correctly to interpret them.

Acquisition of competencies:

Integrated competencies (IC): Ability to solve complex specialized tasks and practical problems in the field of finance, banking and insurance in the course of professional activity or in the process training, which involves the use of certain methods and provisions of financial science and is characterized uncertainty of conditions and the need to take into account the complex requirements for professional and educational activities.

General competencies (GC):

GC 02. Ability to apply knowledge in practical situations

GC 04. Ability to communicate in a foreign language.

GC 05. Skills of using information and communication technologies.

GC 07. Ability to learn and master modern knowledge.

GC 08. Ability to search, process and analyze information from various sources.

GC 10. Ability to work in a team.

Professional (special) competencies (PC):

PC 01. The ability to research trends in the development of the economy due to macro- and microeconomic tools analysis, evaluate modern economic phenomena.

PC 03. Ability to diagnose the state of financial systems (state finances, including budget and tax systems, finances of economic entities, finances households, financial markets, banking system and insurance).

PC 04. Ability to apply economic and mathematical methods and models for solving financial problems.

PC 06. The ability to use modern information and software for receiving and processing data in the field of finance, banking and insurance.

PC 10. Ability to define, justify and take responsibility for professional decisions.

PC11. The ability to maintain an appropriate level of knowledge and constantly improve their professional training.

Program learning outcomes (PLO):

PLO 06. Apply relevant economic and mathematical methods and models for solving financial problems.

PLO 08. Apply specialized information systems, modern financial technologies and software products.

PLO 09. Form and analyze financial statements and correctly interpret the received information.

PLO 10. Identify sources and understand methodology definition and methods of obtaining economic data, collect and analyze the necessary financial information, calculate indicators characterizing the state financial systems.

PLO 11. To have methodical tools for implementation control functions in the field of finance, banking and insurance.

PLO 13. To have general scientific and special methods of researching financial processes.

PLO 16. Apply acquired theoretical knowledge for solving practical tasks in a meaningful way interpret the obtained results.

3. Program and structure of the course for:

- complete full-time form of education.

The programme of the discipline

ECONOMETRICS

Module 1

Methods of construction of general linear model

Theme 1. Subject, methods and objectives of discipline

Nature of econometrics. The role of econometric studies in economics. Object, subject, goals, tasks and structure of the course. Place and course importance among basic disciplines for preparation Bachelor in Economics. Relationship of course to related disciplines. The history of occurrence and the course “Econometrics” in the leading educational institutions in the world. Examples of the application of econometric methods for solving economic problems. The main characteristics of the economic system as the object of modeling. The concept of model. The mathematical model, the main stages of the modeling process. Classification of economic-mathematical models. Contemporary methodological foundations of econometric modelling, a priori and a posteriori role of information. The statistical basis of econometric models. Variable and equations in econometric models, macro- and microeconomic data set and the base, their relationship to aggregation. The main types of econometric models and their relationship to other types of mathematical models. Stages of econometric analysis of economic processes and phenomena’s.

Theme 2. Methods of the general linear model

General view of a linear econometric model, its structure and stages of construction. Specification. Prerequisites for using the method of least squares (OLS 1). Properties of estimates, their characteristics.

Correctness of constructing econometric model and test the significance of parameter estimates and the model itself. Statistical criterias for the assessment of significance. Standard errors and reliability of the forecast. Confidence intervals function of regressions.

Standardized linear econometric model. The economic interpretation of the estimates of the model parameters. Their use in the econometric analysis.

Construction models based on stepwise regression. Simple econometric models. Construction the linear and linear-logarithm production functions. Econometric analysis of production functions, the interpretation of results.

Theme 3. Multicollinearity and its impact on the estimation of the model parameters

The concept of the main principles of the classical correlation econometric analysis. The concept of multicollinearity, methods and characteristics of its identification. Functional and stochastic collinearity. Measurement of multicollinearity. Algorithm of the Farrar-Hlober. Ways to eliminate multicollinearity: exclusion from the

analysis the factor, linear transformation of variables, exceptions trend, turn-based correlation and regression, factorial approach and the method of main components.

Theme 4. Generalized least squares

The concept of heteroscedasticity and methods of its study. The impact of heteroscedasticity on the properties of parameter estimates.

Generalized least squares method (Aitken method) estimates of the parameters of the linear econometric models with heteroscedastic residues. Formation the matrix S . The definition of operator estimates and corresponding covariance matrix. Checking the significance and construction of confidence intervals for the model parameters. Numerical example of the implementation the method of Aitken. Construction the prognosis.

Theme 5. Econometric model of the dynamics

Features of the econometric modelling based on time series. Trend model and methods to determine its parameters. The shape of the trend (linear, parabolic, hyperbolic, logical). Interpretation the parameters of the trend model. Graphic representation of the trend. Evaluation of the trend stability. Coefficient of the trend stability. Justification projected estimates of economic phenomena's.

Module 2

Empirical methods of quantitative analysis based on statistical equations

Theme 6. Empirical methods of quantitative analysis based on statistical equations

The advisability of the use in econometric calculations the statistical equations dependencies. The method of regression analysis and the method of statistical dependence equations. Comparison coefficients is the base of statistical equations dependencies. Calculation parameters of equations dependencies for: simple and curved connection; multiple linear and curvilinear relation. Calculation parameters dependence (one-factor and multifactor), correlation coefficient and index. Forecast calculations.

Sense of equations parameters by different dependencies. Calculation of stability coefficient for evaluation the reliability of the equations of dependencies parameters. Determination the proportion of influence factors on the resultant variable. Plotting one-factor and multiple dependencies. Justification projected estimations of economic phenomena's.

Theme 7. Construction an econometric model with the autocollinearity remains

The concept of autocorrelation. The nature and consequences of autocorrelation in econometric models. Check for autocorrelation. Durbin-Watson criterion.

Estimation of model parameters with autocollinearity remains by such methods: Aitken, transform the input data, Kochrena - Orkatta, Durbin. The feasibility and effectiveness of the use these methods. Using an econometric model to calculate the prediction of the dependent variable with autocorrelation residuals.

Theme 8. Methods of instrumental variables

Causes of correlation appearance between explanatory variables and residues. Estimation of model parameters using instrumental variables. Determination instrumental variables using different operators values: Wald operator evaluation,

features of evaluation by the method of Bartlett, operator evaluation Durbin. Measurement errors of variables.

Theme 9. Distributed lag models

The concept of lag and lagged variables. Determination of the log coefficient. Building mutual correlation function and its graph. Building a distributed lag econometric models. Parameter estimation with lagged values of factors and indicators, correction and prediction.

Theme 10. Econometric models on the basis of system structural equations

General view of the structural form model based on simultaneous equations. Combined shape of model. Record model based on a recursive model. Identified and unidentified equations system. Parameters estimation of model that consists in a system of recursive equations, 1 OLS. The indirect method of least squares (NOLS) and two-step method of least squares (2 OLS). Forecast and general confidence intervals.

Theme 11. Econometric modeling based on nonlinear regression

Nonlinear model. Quasi-linear model. The production Cobb-Douglas function. Building equations system to estimate the parameters of the production function. Characterization of the model parameters. Checking the adequacy of the model and its parameters significance. Precision assessment of prognosis and confidence interval prediction.

STRUCTURE OF THE DISCIPLINE ECONOMETRICS

Names of content modules and themes	Number of Hours												
	Full-time form							Full-time form					
	weeks	total	including					total	including				
			1	p	lab	ind.	self		1	p	lab	ind.	self
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content Module 1. Methods of construction of general linear model													
Topic 1. Subject, methods and objectives of discipline	1	8	2	2			4						
Topic 2. Methods of the general linear model	2	9	2	2			5						
Topic 3. Multicollinearity and its impact on the estimation of the model parameters	3-4	13	4	4			5						
Topic 4. Generalized least squares	5-6	13	4	4			5						
Topic 5. Econometric model of the dynamics	7	10	2	2			6						
Total for content module 1		53	14	14			25						
Content Module 2. Empirical methods of quantitative analysis based on statistical equations													
Topic 6. Empirical methods of	8	10	2	2			6						

quantitative analysis based on statistical equations													
Topic 7. Construction an econometric model with the autocollinearity remains	9-10	14	4	4			6						
Topic 8. Methods of instrumental variables	11-12	14	4	4			6						
Topic 9. Distributed lag models	13	10	2	2			6						
Topic 10. Econometric models on the basis of system structural equations	14	10	2	2			6						
Topic 11. Econometric modeling based on nonlinear regression	15	9	2	2			5						
Total for content module 2	67		16	16			35						
Total hours	120		30	30			60						

4.Seminar topics

№	Topic title	Number of hours
1		
2		
...		

5. Practical class topics

№	Topic title	Number of hours
1.	Subject, methods and objectives of discipline	2
2.	Methods of the general linear model	2
3.	Multicollinearity and its impact on the estimation of the model parameters	4
4.	Generalized least squares	4
5.	Econometric model of the dynamics	2
6.	Empirical methods of quantitative analysis based on statistical equations	2
7.	Construction an econometric model with the autocollinearity remains	4
8.	Methods of instrumental variables	4
9.	Distributed lag models	2
10.	Econometric models on the basis of system structural	2

	equations	
11.	Econometric modeling based on nonlinear regression	2
	Total hours	30

6. Laboratory class topics

Curriculum is not provided this type of work.

7. Independent work topics

№	Topic title	Number of hours
1.	Topic 1. Subject, methods and objectives of discipline	4
2.	Topic 2. Methods of the general linear model	5
3.	Topic 3. Multicollinearity and its impact on the estimation of the model parameters	5
4.	Topic 4. Generalized least squares	5
5.	Topic 5. Econometric model of the dynamics	6
6.	Topic 6. Empirical methods of quantitative analysis based on statistical equations	6
7.	Topic 7. Construction an econometric model with the autocollinearity remains	6
8.	Topic 8. Methods of instrumental variables	6
9.	Topic 9. Distributed lag models	6
10.	Topic 10. Econometric models on the basis of system structural equations	6
11.	Topic 11. Econometric modeling based on nonlinear regression	5
Total hours		60

8. Samples of control questions, tests for assessing the level of knowledge acquisition by students.

1. Object, method and task of the course of “Econometrics”.
2. Role and place of econometric models in the economic systems management.
3. Forming of observation aggregate.
4. Notion of observations homogeneity.
5. Exactness of economic information.
6. Choice of variables and structure of connections.
7. Accidental constituent of econometrical model.
8. Evaluation of model’s parameters by a least-squares method.
9. Coefficient of correlation, verification of hypothesis about meaningfulness of correlation coefficient.
10. Index of correlation.
11. Verification of model on adequacy by Fisher’s a criterion.

12. Concept of multicollinearity.
13. Features of multicollinearity.
14. Farrar-Glober algorithm for multicollinearity determination.
15. Sence of the phenomenon heteroscedasticity.
16. Methods of determination heteroscedanticity
17. Definition of matrix S
18. Method of smallest squares (Eitken method)
19. Forecasting
20. Concept of autocorrelation
21. The consequences of autocorrelation remains
22. Check of autocorrelation
23. Evaluation of model parameters with autocorrelation residues
24. Forecasting methods in dynamic models
25. Properties of model estimates within stochastic variable
26. Method of tool variable
27. Definitions of tool variable
28. Errors of measurament variables
29. Methods with time lag.Methods of evaluation
30. Eitken's method
31. Iterative method
32. Instrumental Variables
33. Two-stage procedure

NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENT SCIENCES OF UKRAINE			
Educational degree "Bachelor" Specialization 072 "Finance, banking, insurance and stock market"	Statistics and Economic Analysis department	Ticket number 1 from the discipline "Econometrics"	Approved Head of the Department of Statistics and Economic Analysis (signature) prof. I.D.Lazaryshyna 2023p.
Examination task			
I. Theoretical question Explain the essence of the random component of the econometric model			
II. Problem Check the linear econometric model $Y = 0,9 + 0,56x + u$ on adequacy if: $\sum (\hat{y}_i - \bar{y})^2 = 11,5$; $\sum (y_i - \hat{y}_i)^2 = 5,7$; $n=12$; $P=0,95$. Make appropriate conclusions.			
III. Test			
1. Define acceptance of hypothesis H_0 for F criterion about the adequacy the model			
<input type="radio"/> a. if $F_{\text{calculated}} > F_{\text{table}}$			
<input type="radio"/> b. if $F_{\text{calculated}} = F_{\text{table}}$			
<input type="radio"/> c. if $F_{\text{calculated}} < F_{\text{table}}$			
2. The main tasks of the correlation analysis:			
<input type="checkbox"/> a. quantitative assessment of the tightness of connection			
<input type="checkbox"/> b. mathematical modeling of the dependence of the effective attribute on the factors			
<input type="checkbox"/> c. qualitative assessment of the tightness of connection			
3. An assessment of the significance of the model parameters can be			
<input type="radio"/> a. F-criterion			
<input type="radio"/> b. determination factor			
<input type="radio"/> c. Student's criterion			
<input type="radio"/> d. correlation coefficient			
4. Multikollinearity means:			
<input type="radio"/> a. Existence of linear dependence or correlation between two or more independent variables			
<input type="radio"/> b. Presence of tailings of econometric model			
<input type="radio"/> c. Not possibility of prognosis of effective index			
<input type="radio"/> d. Not possibility of establishment of degree of freedom is for dispersion of tailings			
<input type="radio"/> e. Being of fictitious factors is in a model			
5. In an econometric investigation forecast of effective index is:			
<input type="radio"/> a. the first stage			
<input type="radio"/> b. the final stage			
<input type="radio"/> c. the second stage			
<input type="radio"/> d. not used			
6. The sum of tailings in correctly built model is evened:			
<input type="radio"/> a. It is not possible to define			

b. 0

c. 100%

d. To any value from 0 to

e. To any value from -1 to 1

7. It is necessary for application of least-squares method, that dispersion of tailings:

a. Equaled a zero

b. It was permanent

c. It was a positive size

d. It was in scopes from 0 to 1

8. The main signs of multicollinearity of factors are:

a. Presence of high values of pairs coefficients of correlation

b. A presence of small values of estimation of model parameters at the high level of coefficient of determination and F-criterion

c. A substantial change of estimations of model parameters at additional introduction to it of explanatory variable

d. The considerable approaching of coefficient of correlation to unit

9. Importance of parameters of equalization of regression is estimated with a help

a. χ^2 -criterion

b. Dispersion

c. t-criterion

d. Standard deviation

e. The least-squares method

10. The estimation of model importance can be:

a. Coefficient of determination

b. Standard deviation

c. Dispersion

d. Coefficient of correlation

e. F-criterion

9. Teaching methods

Teaching methods are ways of joint activities and communication between teachers and graduates, providing positive motivation to learn, mastering the system of professional knowledge, skills and abilities, forming a scientific worldview, development of cognitive forces, culture of mental work of future professionals.

The following teaching methods are used during the educational process:

Depending on the source of knowledge: verbal (explanation, conversation, discussion, dialogue); visual (demonstration, illustration); practical (problem solving, business games).

By the nature of cognitive activity: explanatory-visual problem statement; partial search and research methods.

By place in educational activities:

- methods of organization and implementation of educational activities that combine verbal, visual and practical methods; reproductive and problem-searching; methods of educational work under the guidance of a teacher and methods of independent work of higher education students;
- methods of control and self-control over educational activities: methods of oral, written control; individual and frontal, thematic and systematic control.

In the process of teaching the discipline to intensify the educational and cognitive activities of higher education seekers provides for the use of the following educational technologies:

- work in small groups allows to structure practical seminars on the form and content, creates opportunities for participation of each student in higher education in the work on the topic of the lesson, provides the formation of personal qualities and experience of social communication;
- seminars-discussions involve the exchange of views and views of participants on this topic, as well as develop thinking, help to form views and beliefs, the ability to formulate opinions and express them, learn to evaluate other people's suggestions, critically approach their own views;
- brainstorming - a method of solving urgent problems, the essence of which is to express as many ideas in a limited period of time, discuss and select them;
- case method - a method of analysis of specific situations, which allows to bring the learning process closer to the real practical activities of specialists and involves consideration of industrial, managerial and other situations, complex conflicts, problematic situations, incidents in the study of educational material;
- presentations - speeches to the audience, used to present certain achievements, results of the group, a report on the implementation of individual tasks, briefings, demonstrations.

10. Forms of assessment

Evaluation of student knowledge is carried out on a 100-point scale and is converted to national grades according to Table 1 "Regulations and Examinations and Credits at NULES of Ukraine" (order of implementation dated 26.04.2023, protocol №10), the types of control of higher education are current control, intermediate and final certification.

Ongoing control is carried out during practical, laboratory and seminar classes and aims to check the level of readiness of higher education students to perform specific work.

Intermediate control is conducted after studying the program material and should determine the level of knowledge of higher education students in the program material obtained during all types of classes and independent work.

Forms and methods of intermediate control, mastering the program material are developed by the lecturer of the discipline and approved by the relevant department in the form of testing, written tests, colloquium, etc., which can be assessed numerically.

Mastering the program material by a higher education student is considered successful if his / her rating is not less than 60 points on a 100-point scale.

Semester control is conducted in the form of a semester exam or semester test in a particular discipline.

The semester exam is a form of final attestation of mastering the theoretical and practical material on the academic discipline for the semester.

Semester test is a form of final control, which consists in assessing the mastering of higher education theoretical and practical material (performed by student certain types of work in practical, seminar or laboratory classes and during independent work) in the discipline for the semester.

Differentiated test is a form of control that allows to assess the implementation and mastery of higher education program of practical training, preparation and defense of course work (project).

Applicants for higher education are required to take exams and tests in accordance with the requirements of the working curriculum within the timeframe provided by the schedule of the educational process. The content of exams and tests is determined by the working curricula of disciplines.

The content of exams and tests is determined by the working curricula of disciplines.

11.Distribution of grades received by students.

Evaluation of student knowledge is carried out on a 100-point scale and is converted to national grades according to Table 1 "Regulations and Examinations and Credits at NULES of Ukraine" (order of implementation dated 26.04.2023, protocol №10).

Student rating, points	National grade based on exam results	
	Exams	Credits
90-100	Excellent	Passed
74-89	Good	
60-73	Satisfactory	
0-59	Unsatisfactory	Not passed

In order to determine the rating of a student (listener) in the discipline R_{dis} (up to 100 points), the rating from the exam R_{ex} (up to 30 points) is added to the rating of a student's academic work R_{aw} (up to 70 points): $R_{dis} = R_{aw} + R_{ex}$.

12. Educational and methodological support

1. Regulations.
2. Complex teaching of the discipline.
3. Methodological guidelines for independent study courses.
4. Methodological guidelines for writing a term paper.
5. Elearn <https://elearn.nubip.edu.ua/course/view.php?id=1744>

13. Recommended sources of information

Main

Tutorials

1. Econometric Analysis 8th edition by William H. Greene, Prentice Hall, 2017. 1176 pp.
2. Introduction to Econometrics. 4th edition by James H. Stock and Mark W. Watson, Addison-Wesley, 2018. 800 pp.
3. Introductory Econometrics: A Modern Approach. 7th edition by Jeffrey M. Wooldridge, South-Western College Publishers, 2018. 816 pp.
4. Волошин О. Р., Галайко Н. В. Економетрія. Ч. 1: навч. посібник. Львів: ЛДУВС, 2019. 192 с.
5. Диха М. В., Мороз В. С. Економетрія :навчальний посібник. Київ : Центр учбової літератури, 2019. 206 с.
6. Карімов Г. І. Моделювання та прогнозування в управлінні : навч. посіб. Кам'янське : ДДТУ, 2018. 163 с.
7. Козьменко О.В. Економіко-математичні методи та моделі (економетрика): навчальний посібник. Суми: Університетська книга, 2019. 406.
8. Кузьмичов А. І. Економетрія. Моделювання засобами MS Excel: навчальний посібник. К. : ЦУЛ, 2019. 214 с.
9. Лещинський О. Л., Рязанцева В. В., Юнькова О. О. Економетрія: навч. посібник для студ. вищ. навч. закладів. К.: МАУП, 2018. 205 с.
10. Назаренко А. М. Економетрика: навч. посібник. Суми: Вд-во СумГУ, 2020. 404 с.
11. Наконечний С. І., Терещенко Т. О., Романюк Т. П. Економетрія: підручник. К.: КНЕУ, 2018. 352с.
12. Присенко Г. В., Равікович Є.І. Прогнозування соціально-економічних процесів: навч. посібник. К.: КНЕУ, 2020. 378 с.
13. Руська Р. В. Економетрика: навч. посібник. Тернопіль: Тайп, 2021. 248 с.

Supplementary

14. Quirk T. Excel 2010 for Business Statistics. A Guide to Solving Practical. Business Problems, School of Business and Technology Webster University, 2018, 264 p.
15. Гур'янова С. Прикладна економетрика : навч. посіб. : у двох частинах. Частина1. Харків : ХНЕУ ім. С. Кузнеця, 2019. 235 с.

Information Resources

1. Верховна Рада України. URL: <http://zakon.rada.gov.ua/>
2. Кабінет Міністрів України. URL: <http://www.kmu.gov.ua/control/>
3. Державний Комітет статистики України. URL: <http://ukrstat.gov.ua/>
4. Продовольча та сільськогосподарська організація ООН (ФАО). URL: <http://www.fao.org/>
5. Світовий банк. URL: <http://www.worldbank.org/>
6. Євростат. URL: <http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home>
7. Положення про екзамени та заліки у Національному університеті біоресурсів і природокористування України, затверджене Вченою радою НУБіП України від 26.04.2023 р. протокол № 10. URL: https://nubip.edu.ua/sites/default/files/u284/polozh_ekzameni_zaliki_z_dopovnennym_2023_na_sayt.pdf