NATIONAL UNIVERSITY
OF LIFE AND ENVIRONMENTAL SCIENCES OF UKRAINE

Department of Statistics and Economic Analysis

"CONFIRMED"
Dean of the Economic faculty,
_____ Anatolii DIBROVA
"28" August 2024

"APPROVED"
at the meeting of the Department
of Statistics and Economic Analysis
Minutes №1 from "20" August 2024
Head of the Department
_____ Andrii MUZYCHENKO

"REVIEWED"
Program Coordinator
Olena KIREITSEVA

PROGRAM OF THE COURSE

ECONOMETRICS

Field of study	05 Social and Behavioral Sciences
Specialty	051 "Economics"
Academic program	International Economics
Faculty:	Economic Faculty
Lecturers:	**Lesia Voliak,** Associate Professor of the Department of Statistics and Economic Analysis, PhD in Economics

Kyiv – 2024

Description of the discipline <u>ECONOMETRICS</u>

Academic degree, specialty, academic programme	
Academic degree	*Bachelor*
Specialty	*051 " Economics "*
Academic programme	*International economics*
Characteristics of the course	
Type	Compulsory
Total number of hours	120
Number of ECTS credits	4
Number of modules	2
Course project (work) (if applicable)	-
Form of assessment	*Exam*

Indicators of the discipline for full-time and part-time forms of university study		
	Full-time form	Part-time form
Year of study	3	
Semester	5	
Lectures	*30 hours*	*hr.*
Practical, seminar classes	*30 hours.*	*hr.*
Laboratory classes	-	*hr.*
Self-study	*60 hours*	*hr.*
Number of hours per week for full-time students	*4 hours*	

1. Aim, objectives, competences and expected learning outcomes of the discipline

Aim of econometrics is acquisition by the future specialist's 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.

Objectives of the course are as follows:

- mastering the methods of building and evaluating econometric models;

- acquisition of practical skills of quantitative measurement of interrelationships of economic indicators;

- definition of criteria for testing the hypothesis regarding economic qualities indicators and forms of their connection;

- deepening of theoretical knowledge in the field of mathematical modelling economic processes and phenomenon's;

- using the results of econometric analysis for forecasting and making informed economic decisions.

Acquisition of competencies:

Integrated competencies (IC): The ability to solve complex specialized tasks and practical problems in the economic sphere, which are characterized by complexity and uncertainty of conditions, involving the application of theories and methods of economic science.

General competencies (GC)*:*

GC 3. Ability for abstract thinking, analysis, and synthesis.

GC7. Skills in using information and communication technologies.

GC11. Ability to make informed decisions.

Special (professional) competences (SC):

PC6. Ability to apply economic and mathematical methods and models to solve economic problems.

PC7. Ability to use computer technologies and data processing software to solve economic tasks, analyze information, and prepare analytical reports.

PC8. Ability to analyze and solve tasks in the field of economic and socio-labor relations.

PC9. Ability to forecast socio-economic processes based on standard theoretical and econometric models.

Expected Learning Outcomes (ELO):

ELO 5. Apply analytical and methodological tools to substantiate proposals and make managerial decisions by various economic agents (individuals, households, enterprises, and government).

ELO 8. Applying appropriate economic and mathematical methods and models to solve economic problems.

ELO 10. Conduct an analysis of the functioning and development of business entities, identify functional areas, and calculate relevant indicators that characterize the effectiveness of their activities.

2. Program and structure of the discipline for:

- full-time form of study.

Modules and topics	weeks	total	l	p	lab	ind.	self	total	l	p	lab	ind.	self
			Number of hours										
		Full-time form						Full-time form					
	weeks	total	including					total	including				
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Module 1. **Methods of construction of general linear model**													
Topic 1. Methodical principles of econometrics	1	12	2	2			8						
Topic 2. Regression model	2-4	24	6	6			12						
Topic 3. Multicollinearity and its impact on the estimation of the model parameters	5-7	20	6	6			8						
Total for content module 1		56	14	14			28						
Module 2. **Empirical methods of quantitative analysis based on statistical equations**													
Topic 4. Heteroscedasticity	8-9	16	4	4			8						
Topic 5. Autocorrelation	10-11	16	4	4			8						
Topic 6. Methods of instrumental variables	12-13	16	4	4			8						
Topic 7. Models with time lag (methods of evalution)	14-15	16	4	4			8						
Total for content module 2		64	16	16			32						
Total hours		120	30	30			60						

3. Topics of practical classes

№	Topic title	Number of hours
1.	Methodical principles of econometrics	2
2.	Regression model	6
3.	Multicollinearity and its impact on the estimation of the model parameters	6
4.	Heteroscedasticity	4
5.	Autocorrelation	4
6.	Methods of instrumental variables	4
7.	Models with time lag (methods of evalution)	4
	Total hours	30

4. Topics for self-study

№	Topic title	Number of hours
1.	Topic 1. Methodical principles of econometrics	8
2.	Topic 2. Regression model	12
3.	Topic 3. Multicollinearity and its impact on the estimation of the model parameters	8
4.	Topic 4. Heteroscedasticity	8
5.	Topic 5. Autocorrelation	8
6.	Topic 6. Methods of instrumental variables	8
7.	Topic 7. Models with time lag (methods of evalution)	8
Total hours		60

5. Tools for assessing expected learning outcomes:
(select necessary or add)

- exam;
- credit;
- module tests;
- abstracts;
- presentation of laboratory and practical works.

6. Teaching methods:
(select necessary or add)

- verbal method (lecture, discussion);
- practical method (practical classes);
- visual method (illustration, demonstration);
- processing learning resources (note-taking ,summarising, reviewing, writing an abstract);
- video method (remote, multimedia);
- self-study (completing assignments);
- individual research work.

7. Assessment methods:
(select necessary or add)

- exam;
- oral or written assessment;
- module tests;
- presentation of laboratory and practical works;
- presentations at academic events.

8. Distribution of points received by students

The assessment of students' knowledge and skills is conducted by means of a 100-point scale and is converted into national grades according to Table 1 of

the current *Exam and Credit Regulations at NULES of Ukraine*.

Student's rating, points	National grading of exams and credits	
	exams	credits
90-100	excellent	pass
74-89	good	
60-73	satisfactorily	
0-59	unsatisfactorily	fail

To determine a student's rating in the discipline R_{DIS} (up to 100 points), the received assessment rating R_A (up to 30 points) is added to the academic performance raiting R_{AP} (up to 70 points): $R_{DIS} = R_{AP} + R_A$.

9. Educational and methodological support
1. Voliak L.R. Electronic training course of the discipline «Econometrics». URL: https://elearn.nubip.edu.ua/course/view.php?id=1744
2. Abstracts of lectures and their presentations (in electronic form). URL: https://elearn.nubip.edu.ua/course/view.php?id=1744
3. Воляк Л.Р.? Макарчук О.Г. Методичні рекомендації для лекційних занять «Econometrics» з дисципліни «Економетрика» для підготовки студентів англомовних груп ОС "Бакалавр" зі спеціальностей 051 «Економіка» (Міжнародна економіка). 2024. 128 с. (Електронний ресурс)

10. Recommended sources of information
1. Bruce E. Hansen. Econometrics. University of Wisconsin. Princeton University Press, 2022, 700 p.
2. Business Problems, School of Business and Technology Webster University, 2018, 264 p.
3. Hamulczuk M. Makarchuk O., Kuts T. (2021). Time-Varying Integration of Ukrainian Sunflower Oil Market with the EU Market. Agris on-line (Papers in Economics and Informatics), XIII, 3;.URL: https://online.agris.cz/archive/2021/03/04
4. Hamulczuk M, Cherevyk D, Makarchuk O, Kuts T; Voliak L. Integration of Ukrainian Grain Markets with Foreign Markets During Russia's Invasion of Ukraine. Zagadnienia Ekonomiki Rolnej. (2023). Volume 377. Issue 4. DOI: 10.30858/zer/177396
5. Introduction to Econometrics: Theory and practice. URL: https://www.udemy.com/course/introduction-to-econometrics-theory-and-practice/ (дата звернення 01.06.2024р.)
6. James H. Stock and Mark W. Watson. Introduction to Econometrics. 4th edition, Addison-Wesley, 800 p. URL https://www.sea-stat.com/wp-

content/uploads/2020/08/James-H.-Stock-Mark-W.-Watson-Introduction-to-Econometrics-Global-Edition-Pearson-Education-Limited-2020.pdf

7. O. Faichuk, L. Voliak, T. Hutsol, S. Glowacki, Y. Pantsyr, S. Slobodian, A. Szeląg-Sikora, Z. Gródek-Szostak. European Green Deal: Threats Assessment for Agri-Food Exporting Countries to the EU. (2022). Journal of Sustainability, [14(7), 3712; https://doi.org/10.3390/su14073712.

8. Quirk T. Excel 2010 for Business Statistics. A Guide to Solving Practical. Business Problems, School of Business and Technology Webster University, 2018, 264 p.

9. Sean Becketti. Introduction to Time Series Using Stata. Stata Press, 2020, 670 p.

10. Sova Olena, Voliak Lesia, Khmurova Viktoriia. Rationales for efficient and effective green financing under emergency rules. Academy Review. 2023. Issue 2. P. 90-102.

11. Березька К. М. Економетрика: Основи теорії та комп'ютерний практикум (для студентів економічних спеціальностей денної та заочної форм навчання). Тернопіль: ЗУНУ, 2022. 152 с.

12. Волошин О. Р., Галайко Н. В. Економетрія. Ч. 1: навч. посібник. Львів: ЛДУВС, 2019. 192 с.

13. Воляк Л.Р. Моделювання та кількісний вимір впливу основних факторів на продуктивність рослинництва. Науковий вісник Національного університету біоресурсів і природокористування України. Серія: Економіка, аграрний менеджмент, бізнес. 2016. Вип. 249. С. 117–125.

14. Гур'янова С. Прикладна економетрика : навч. посіб. : у двох частинах. Частина1. Харків : ХНЕУ ім. С. Кузнеця, 2019. 235 с.

15. Державний Комітет статистики України. URL: http://ukrstat.gov.ua/ (дата звернення 01.06.2024р.)

16. Диха М. В., Мороз В. С. Економетрія :навчальний посібник. Київ : Центр учбової літератури, 2019. 206 с.

17. Євростат. URL: http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home (дата звернення 01.06.2024р.)

18. Єрьоменко В. О., Алілуйко А. М., Березька К. М., Мартинюк О. М. Економетрика : навч. посіб. Тернопіль : Підручники і посібники, 2023. 168 с.

19. Іващук О. Т., Дзюбановська Н. В. Економетрика: Методичні рекомендації до розв'язування практичних завдань для студентів денної форми навчання (посібник), вид. 2-ге, доп. та перероб. Тернопіль : ЗУНУ, 2022. 159 с.

20. Козьменко О.В. Економіко-математичні методи та моделі (економетрика): навчальний посібник. Суми: Університетська книга, 2019. 406 с.

21. Козьменко О.В., Кузьменко О.В. Економіко-математичні методи і моделі: економетрика. Університетська книга, 2023. 406 с.

22. Кузьмичов А. І. Економетрія. Моделювання засобами MS Excel: навчальний посібник. К. : ЦУЛ, 2019. 214 с.

23. Назаренко А. М. Економетрика: навч. посібник. Суми: Вд-во СумГУ, 2020. 404 с.

24. Присенко Г. В., Равікович Є.І. Прогнозування соціально-економічних процесів: навч. посібник. К.: КНЕУ, 2020. 378 с.

25. Продовольча та сільськогосподарська організація ООН (ФАО). URL: http://www.fao.org/

26. Руська Р. В. Економетрика: навч. посібник. Тернопіль: Тайп, 2021. 248 с.

Recommended sources of information (Electronic Resources)

1. Кабінет Міністрів України. URL: http://www.kmu.gov.ua/control/

2. Державний Комітет статистики України. URL: http://ukrstat.gov.ua/

3. Продовольча та сільськогосподарська організація ООН (ФАО). URL: http://www.fao.org/

4. Світовий банк. URL: http://www.worldbank.org/

5. Євростат. URL: http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home