	COURSE SYLLABUS **ECONOMIC AND MATHEMATICAL METHODS AND MODELS**
	Level of higher education - Bachelor
	Specialization 076 "Entrepreneurship, trade and exchange activity"
	Education programme "Entrepreneurship, trade and exchange activity"
	Academic year __3__, семестр __6__
	Form of study __full-time__ (full-time, extramural**)**
	Number of ECTS credits __4__
	Language of instruction __English__ (Ukrainian, English, German)
Course lecturer	**Makarchuk O.G.**
Lecturer contact information (e-mail)	**makarchuk.o.g@nubip.edu.ua**
Course page in eLearn	**https://elearn.nubip.edu.ua/course/view.php?id=5109**

COURSE DESCRIPTION

(up to 1000 printed characters)

The course "Economic-Mathematical Methods and Models" belongs to series of disciplines that form the profile of the future specialist, equipping him with basic knowledge of the theory and practice in the application of economic and mathematical methods and models, because economic systems can't be effectively studied without using the modern theoretical methods and practical experiment.

The purpose of studying this course is to form future specialists in modern thinking and give them a system of fundamental theoretical knowledge of economic-mathematical methods and models, and applied practical skills using information technology tools (including MS Excel, etc.); acquiring skills in research and analysis of economic processes and phenomena to make adequate management decisions.

The task of studying the discipline is theoretical and practical training of students on the methodology and methods of research of economic processes and phenomena using the tools of economic and mathematical modeling.

Competencies of the educational programme:

Integrated competencies (IC): Ability to solve complex specialized tasks and problems in the spheres of business, trade and exchange activity or in the process of training, which involves application of theories and methods of organization and functioning of business, trade, stock exchange structures and is characterized complexity and uncertainty of conditions

General competencies (GC):
GC 1. Ability to abstract thinking, analysis and synthesis
GC 2. Ability to apply acquired knowledge in practical situations.
GC 4. Ability to communicate in a foreign language.
GC 5. Skills of using information and communication technologies.
GC 6. Ability to search, process and analyse information from various sources.

Professional (special) competencies (PC):
PC 2. Ability to choose and use appropriate methods, tools for justifying decisions regarding creation, functioning of entrepreneurial,
trade and exchange structures.
PC 4. Ability to apply innovative approaches in business, trade and exchange activities
structures.
PC 10. Ability to business planning, evaluation market conditions and results of activities in the field entrepreneurship, trade and stock exchange practice with
taking into account the risks.
PC 12. Ability to analytical, trading activity on international and domestic commodity exchanges.

Program learning outcomes (PLO) of the educational programme:

PLO 1. Use basic knowledge of entrepreneurship, trade and stock market activity and the ability to think critically, analyze and

synthesize for professional purposes.
PLO 2. Apply acquired knowledge to identify, set and solve tasks for various practical situations in business, trade and stock exchange activities.
PLO 3. Have the skills of written and oral professional communication in the state and in foreign languages.
PLO 5. Organize search, independent selection, high-quality processing of information from various sources for the formation of data banks in the field of entrepreneurship, trade and stock exchange activity
PLO 6. Be able to work in a team, have interpersonal skills, which allow you to achieve professional goals.
PLO 12. To have methods and tools for substantiating management decisions on the creation and functioning of business, trade and stock exchanges structures.

COURSE STRUCTURE

Topic	**Hours** (lectures/labs, practical classes, seminars)	**Learning outcomes**	**Tasks**	**Assessment**
Semester 6				
Module 1				
Topic 1. Theoretical foundations of mathematical modeling and classification of models Topic 2. Principles and stages of construction Economic mathematical models Topic 3. Basic methods of formalizing economic conditions Topic 4. The general problem of linear programming and its canonical figures Topic 5. Geometric interpretation of	1/2 1/4 2/4 2/4	To know the main concepts of Mathematical Programming: the modern theory; theorems, methods; essence and history of the academic discipline; studying the main methods for solving the problems of the course; realization of formal research received by the solver.	Students will enhance their understanding and acquire practical skills by working through the exercises, which are of three types. Theory exercises on derivations and model extensions. Simulation exercises illustrating statistical properties of econometric models and methods. Empirical exercises on applications with business and	Execution and delivery of practical works - credited. Module: descriptive part 100; test part 30 * 0.1; Independent work - according to the evaluation journal in eLearn**.**

linear programming problems Topic 6. The solution of simplex Topic 7. Theory of duality and duality of linear optimization estimates tasks	1/4 1/4 2/4		economic data sets to solve questions of practical interest.	
Module 2				
Topic 8. Transport problems of linear programming Topic 9. Analysis of optimization solutions tasks Topic10. Mathematical modeling of the agricultural industry Topic 11. Applied financial models. Production models Topic 12. Applied financial models	1/4 1/4 1/4 1/3 1/4	To know the main concepts of Mathematical Modelling: the modern theory, studying the main types of models for solving the problems of the course; realization of formal research received by the solver	Tasks of practical work. Writing tests, essays. Doing independent work (including in elearn) Problem solving, presentations etc.	Execution and delivery of laboratory works - credited. Module: descriptive part 100; test part 30 * 0.1; Independent work - according to the evaluation journal in eLearn**.**
Total for 6 Semester				**70**
Exam				**30**
Total for course				**100**

ASSESSMENT POLICY

Policy regarding deadlines and resits:	Assignments submitted after the deadline without valid reasons will be graded lower. Resitting of modules will be allowed with the permission from the lecturer and in the presence of valid reasons (e.g. medical reasons).
Academic honesty policy:	Cheating during tests and exams is strictly prohibited (including the use of mobile devices). Coursework and research papers must contain correct citations for all sources used.
Attendance policy:	Class attendance is mandatory. In case of objective reasons (such as illness or international internships), individual learning may be allowed (in online format by the approval of the dean of the faculty).

SCALE OF ASSESSMENT OF STUDENT KNOWLEDGE

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

RECOMMENDED SOURCES OF INFORMATION

12. 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. Білоусова С.В., Ковальчук Т.В. Економіко-математичне моделювання: компендіум і практикум: навч. посіб. К.: Київ. нац. торг.-екон. ун-т, 2018. 524 с.
5. Волошин О. Р., Галайко Н. В. Економетрія. Ч. 1: навч. посібник. Львів: ЛДУВС, 2019. 192 с.
6. Диха М. В., Мороз В. С. Економетрія :навчальний посібник. Київ : Центр учбової літератури, 2019. 206 с.
7. Економіко-математичні методи і моделі в галузі управління персоналом: навч. посіб. /За заг. редакцією Л.В. Мазник. К. : Кафедра, 2019. 290 с.
8. Економіко-математичні методи та моделі у науково-дослідних роботах: навч. посіб. / за заг. ред. д-ра екон. наук, проф. О. Є. Кузьміна. Львів : Видавництво Львівської політехніки, 2021. 284 с.
9. Економіко-математичні методи та моделі: навч. посіб./ Заг. редакцією В.М. Мацкул . Одеса: ОНЕУ, 2018. 404 с.
10. Карімов Г. І. Моделювання та прогнозування в управлінні : навч. посіб. Кам’янське : ДДТУ, 2018. 163 с.

11. Козьменко О.В. Економіко-математичні методи та моделі (економетрика): навчальний посібник. Суми: Університетська книга, 2019. 406.
12. Кузьмичов А. І. Економетрія. Моделювання засобами MS Excel: навчальний посібник. К. : ЦУЛ, 2019. 214 с.
13. Лещинський О. Л., Рязанцева В. В., Юнькова О. О. Економетрія: навч. посібник для студ. вищ. навч. закладів. К.: МАУП, 2018. 205 с.
14. Назаренко А. М. Економетрика: навч. посібник. Суми: Вд-во СумГУ, 2020. 404 с.
15. Наконечний С. І., Терещенко Т. О., Романюк Т. П. Економетрія: підручник. К.: КНЕУ, 2018. 352с.
16. Присенко Г. В., Равікович Є.І. Прогнозування соціально-економічних процесів: навч. посібник. К.: КНЕУ, 2020. 378 с.
17. Руська Р. В. Економетрика: навч. посібник. Тернопіль: Тайп, 2021. 248 с.

Supplementary

18. Quirk T. Excel 2010 for Business Statistics. A Guide to Solving Practical. Business Problems, School of Business and Technology Webster University, 2018, 264 p.
19. Гур'янова С. Прикладна економетрика : навч. посіб. : у двох частинах. Частина1. Харків : ХНЕУ ім. С. Кузнеця, 2019. 235 с.
20. Молчанюк І.В., Плотніков А.В., Єжов М.Б. Розгорнутий план лекцій з дисципліни «Економіко-математичні методи та моделі» для студентів першого (бакалаврського) рівня галузі знань 07 «Управління та адміністрування». 2020. 25с.
21. Оптимізаційні методи та моделі в підприємницькій діяльності : Навч. посіб. / Л.О. Волонтир, Н.А. Потапова, І.М. Ушкаленко, І.А. Чіков, Вінницький національний аграрний університет. Вінниця : ВНАУ, 2020. 404 с.
22. Теоретичні основи кількісних методів моделювання та прогнозування економічних процесів. URL: http://bookss.co.ua/book_medoti-ekonomyko-statestichnih-doslidzhen_ 806/3_1.-teoretichn-osnovi-klksnih-metodv-modelyuvannya-taprognozuvannya-ekonomchnih-procesv.
23. Якимова Л. П. Оптимізаційні методи та моделі : практикум в MS Excel : навч.- метод. посіб. Чернівці : Чернівец. нац. ун-т ім. Ю. Федьковича, 2022. 272 с.

Information Resources

1. Верховна Рада України. URL: http://zakon.rada.gov.ua/
2. Державний Комітет статистики України. URL: http://ukrstat.gov.ua/

3. Євростат. URL: http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home
4. Кабінет Міністрів України. URL: http://www.kmu.gov.ua/control/
5. Міністерство фінансів України http://www.minfin.gov.ua
6. Нормативні акти України - законодавство для практиків http://www.nau.kiev.ua
7. Офіційний вісник України http://www.gdo.kiev.ua
8. Продовольча та сільськогосподарська організація ООН (ФАО). URL: http://www.fao.org/
9. Світовий банк. URL: http://www.worldbank.org/
10. 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_dopovnennyam_2023_na_sayt.pdf