SYLLABUS OF THE ACADEMIC DISCIPLINE
Applied modeling:
"Economic-Mathematical Modeling"

Level of Higher Education - "Bachelor"
Field of Knowledge: 07 "Management and Administration".
Specialty**:** 075 "Marketing "
Educational and professional program of Study **"**Marketing**"**
Year of Study**:** 2**,** Semester**:** 4
The form of study**:** Full-time study
The number of ECTS credits**:** 3
Language of instruction: English

Course Lecturer	**Liudmyla Galaieva (Галаєва Людмила Валентинівна)** Associate Professor, Ph.D., Department of Economy Cybernetics
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Virtual Office Hours (eLearn)	https://elearn.nubip.edu.ua/course/view.php?id=5115

DESCRIPTION OF THE COURSE

The Academic Discipline Applied modeling: "Economic-Mathematical Modelling" 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 efficient management decisions.

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

COMPETENCES

Integral Competence (IC):

The ability to solve complex specialized tasks and practical problems in the field of marketing activities or in the learning process, which involves the application of relevant theories and methods and is characterized by complexity and uncertainty of conditions.

General Competencies (GC):

GC 3. Ability to abstract thinking, analysis and synthesis.
GC4. Ability to learn and master modern knowledge.
GC5. Determination and perseverance in the assigned tasks and responsibilities.
GC11. Ability to work in a team.

GC14. Ability to act socially responsibly and consciously.

Program Learning Outcomes (PLO):

PLO3.Apply acquired theoretical knowledge to solve problems practical tasks in the field of marketing.

PLO5. Identify and analyze the key characteristics of marketing systems of different levels, as well as the characteristics of the behavior of their subjects.

PLO9. Assess the risks of marketing activities, establish the level of uncertainty of the marketing environment when making management decisions.

PLO11. Demonstrate the ability to apply an interdisciplinary approach and perform marketing functions of a market entity.

PLO14. Perform functional responsibilities in the group, offer sound marketing solutions.

COURSE STRUCTURE

Topics	Hours (lectures / laboratory classes)	Learning outcomes	Tasks	Knowledge assessment
Semester # 4				
Module # 1				
Topic # 1. Optimization models and methods.	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.	Performing practical tasks, self-study work using information technology tools in elearn.	20
Topic # 2. Linear programming. Methods for solving Linear Programming Problems.	2/4			20
Topic # 3. Duality in linear programming.	2/4			10
Topic # 4. Transportation Problem.	2/4			20
Topic # 5. Nonlinear Programming Problems.	1/2			Case work with Topic # 7
Test and task to Module # 1				30
Total (on the content of module # 1)				100
Module # 2				
Topic # 6. The theoretical basis of Economic Mathematical Modelling.	2/4	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;	Performing practical tasks, self-study work using information technology	20
Topic # 7. The Models in Agriculture.	2/4			20

Topic # 8. Some sections of modelling (Risk, Financial etc.).	2/4	performance of the analysis of the solution.	tools in elearn.	30
Test to Module # 2				**30**
Total (on the content of module # 2)				**100**
Total for educational work	$R_{EW} = \frac{0{,}7 \cdot (R_{MOD\,1} + R_{MOD\,2})}{2}$			**70**
Certification (**Exam)**				**30**
Total	$R_{DIC} = R_{EW} + R_{CER}$			**100**

EVALUATION POLICY

Deadline and reassembly policy:	Works that are submitted in violation of deadlines without good reason are evaluated at a lower grade. Relocation of modules takes place with the permission of the teachers who provide the course, if there are serious reasons (for example, hospital).
Academic Integrity Policy:	Copying of the text during written tests and exams is prohibited. The use of mobile devices is allowed only with the permission of the teacher during online testing and preparation of practical tasks. Self-Study works in the form of abstracts, reports, presentations must have correct text links to the information sources used.
Attendance Policy:	Attendance is mandatory. For objective reasons (for example, illness, international internship) training can take place individually at a distance (online form in agreement with the dean of the faculty and the lecturer of the course).

STUDENT EVALUATION SCALE

National Grade	Rating of the Higher Education Learners, Score
“Excellent”	90 - 100
“Good”	74 - 89
“Satisfactory”	60 - 73
“Failed”	0 - 59

BASIC LITERATURE

1. Carl P. Simon, Lawrence Blume. Mathematics for economists. New York, London: W.W.Norton & Company, 1994. 930p.
2. Cox D., Cox M. The Mathematics of Banking and Finance. The Atrium, Southern Gate, Chichester, John Wiley & Sons Ltd, 2006. 312 p.
3. Dantzig, G.B. Linear Programming and Extensions. Princeton, NJ: Princeton University Press, 1998. 656 p.
4. Galaieva L, Shulga N, Lipska V. Optimization Methods and Models. Kyiv: Printed Centre CP «Komprint», 2016. 259 p.
5. Drury C. Management and cost accounting. C&C Offset, China, 2008. 775p.
6. Peter B.R. Hazell, Roger Norton. Mathematical programming for economic analysis in agriculture. Macmillan Publishing Company, 1986. 400p.
7. Ruric E. Wheller, W.D. Peeples, Jr. Modern Mathematics with Applications to Business and the Social Sciences. Forth Edition. Monterey, California: Brooks/Cole Publishing Company, 1986. 707p.
8. Taha Hamdy A. Operations Research. Ninth Edition. Prentice Hall; 2010. 832 p.
9. Tan S.T. Calculus for the Managerial, Life, and Social Sciences. Fifth Edition. Brooks. – Cole Thomson Lerning, 2000. 729p.
10. Галаєва Л.В., Рогоза Н.А., Шульга Н.Г. Дослідження операцій Ч.1/ Навчальний посібник К.: ЦП «Компринт», 2018. 290 с.
11. Жадлун З.О., Галаєва Л.В., Шульга Н.Г. Економіко-математичне моделювання з основами математичного програмування. Навчальний посібник/укл.: Жадлун З.О., Галаєва Л.В., Шульга Н.Г. Київ: ТОВ “Agrar Media Group”, 2016. 266с.
12. Галаєва Л.В., Шульга Н.Г., Ліпська В.В. Оптимізаційні методи і моделі (англійською мовою), К.:ТОВ ЦП КОМПРИНТ, 2016. – 336 с.
13. Жадлун З.О., Галаєва Л.В., Шульга Н.Г. Математичне програмування. Київ.: ЦП «Компринт», 2017. 360с.

Additional literature

1. Наконечний С.І., Гвоздецька Л.В. Збірник задач з курсу «Математичне програмування» 1: Навч.посібник. К.: ІЗМН, 2006.
2. Галаєва Л.В., Коваль Т.В., Шульга Н.Г. Економіко-математичний словник / [для студентів економічних спеціальностей вищих навчальних закладів]. К.: ЦП «Компринт», 2017. 265 с.

Methodological references

1. Galaeva L.V., Shulga N.G. Optimization problems and their economical applications**.** Methodical textbook. Kyiv. Printed Centre CP «Komprint», 2016. 159 p. http://elibrary.nubip.edu.ua
2. Жадлун З.О., Галаєва Л.В., Шульга Н.Г. Оптимізаційні моделі та методи їх реалізації/ Київ: НУБіПУ, 2015. 150 с.
3. Методи розв’язку оптимізаційних задач. Методичні вказівки до виконання лабораторних та практичних завдань (для студентів економічних спеціальностей) / НУБіПУ; уклад.: Л. В. Галаєва, Н.Г.Шульга. К.: ТОВ «ЦП КОМПРИНТ», 2015. 93 с. http://elibrary.nubip.edu.ua
4. Моделювання використання добрив. Методичний посібник для студентів економічних спеціальностей/ уклад.: З. О. Жадлун, Л. В. Галаєва, Н. Г. Шульга. Київ: Редакційно-видавничий відділ НУБіП України, 2014. 40 с.

5. Оптимізація галузевої структури сільськогосподарського підприємства. Методичні вказівки для економічних спеціальностей/ уклад.: Л.В.Галаєва, Н. А. Рогоза, Н. Г. Шульга. Київ: Видавничий центр НУБіП України, 2013. 34 с.

Electronic Resources

1.MOODLE: https://elearn.nubip.edu.ua/course/view.php?id=5115
2. Food and Agriculture Organization Corporate Statistical Database http://faostat.fao.org
3. Державна служба статистики України http://www.ukrstat.gov.ua/
Market outlook report: http://www.agr.gc.ca/pol/mad-dam/index_e.php?s1