



## SYLLABUS OF THE ACADEMIC DISCIPLINE

### Applied modeling: “Economic-Mathematical Modeling”

Level of Higher Education - "Bachelor"  
Field of Knowledge: 07 “Management and Administration”.  
Specialty: 073 “Management”  
Educational and professional program of Study “Management”  
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)**  
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#### Virtual Office Hours (eLearn)

<https://elearn.nubip.edu.ua/course/view.php?id=4212>

## DESCRIPTION OF THE COURSE

The Academic Discipline “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.

### **The discipline provides the formation of a number of competencies:**

#### **Integral Competence (IC):**

The ability to solve complex specialized tasks and practical problems characterized by complexity and uncertainty in the conditions in the field of management or in the learning process, which involves the application of theories and methods of social and behavioral sciences.

#### **General Competencies (GC):**

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

GC 8. Skills in using information and communication technologies.

GC 10. Ability to conduct research at the appropriate level.

#### **Special (Professional) Competencies (PC):**

PC 2. The ability to analyze the results of the organization's activities, compare them with the factors of influence of the external and internal environment.

PC 3. The ability to determine the prospects for the development of the organization.

PC 12. The ability to analyze and structure problems of the organizations to make informed decisions.

**Program Learning Outcomes (PLO):**

PLO 6. Reveal the skills of searching, collecting and analyzing information, calculating indicators to justify management decisions.

PLO 19. Demonstrate the ability to make independent decisions, develop a sufficient number of alternatives, choose the best solutions and be responsible for their implementation.

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**COURSE STRUCTURE**

<b>Topics</b>	<b>Hours (lectures / laborator y classes)</b>	<b>Learning outcomes</b>	<b>Tasks</b>	<b>Knowledge assessment</b>
<b>Semester # 4</b>				
<b>Module # 1</b>				
Topic # 1. Optimization mode ls 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
<b>Module # 2</b>				
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	Performing practical tasks, self- study work using	20

Topic # 7. The Models in Agriculture.	2/4	problems of the course; realization of formal research received by the solver; performance of the analysis of the solution.	information technology tools in elearn.	20
Topic # 8. Some sections of modelling (Risk, Financial etc.).	2/4			30
Test to Module # 2				<b>30</b>
Total (on the content of module # 2)				<b>100</b>
Total for educational work	$0,7 \cdot (R_{MOD1} + R_{MOD2})$ $R_{EW} = \frac{\text{-----}}{2}$			<b>70</b>
Certification ( <b>Exam</b> )				<b>30</b>
<b>Total</b>	<b><math>R_{DIC} = R_{EW} + R_{CER}</math></b>			<b>100</b>

### 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