



**Syllabus of the educational discipline**  
**«Operation Research and Optimization Methods»**

<b>Specialty</b>	<i>051 Economics</i>
<b>Educational program</b>	<i>International economics</i>
<b>Level of education</b>	<i>First (bachelor) level of higher education</i>
<b>Discipline status</b>	<i>Compulsory</i>
<b>Teaching language</b>	<i>English</i>
<b>Course / semester</b>	<i>2<sup>nd</sup> course, 3<sup>rd</sup> semester</i>
<b>Number of ECTS credits</b>	<i>5 credits</i>
<b>Distribution by types of trainings and hours of study</b>	<i>Lectures – 24 hours. Practical studies – 12 hours. Laboratory studies – 12 hours. Independent training – 102 hours.</i>
<b>Form of final assessment</b>	<i>Exam</i>
<b>Department</b>	<i>Department of higher mathematics, economical and mathematical methods, room 329 (main building), phone number (057) 7020405 (or 3-33), department site: <a href="http://www.vm.hneu.edu.ua/">http://www.vm.hneu.edu.ua/</a></i>
<b>Teacher (-s)</b>	<i>Misiura Ievgeniia Iuriivna, PhD in technics, associate professor</i>
<b>Teacher's contacts</b>	<i>Misiura Ie. Iu.: <a href="mailto:Ievgeniia.Misiura@hneu.net">Ievgeniia.Misiura@hneu.net</a></i>
<b>Days of classes</b>	<i>Lectures: <a href="#">according to the schedule</a> Practical studies: <a href="#">according to the schedule</a> Laboratory studies: <a href="#">according to the schedule</a> <a href="http://rozklad.hneu.edu.ua/schedule/schedule?employee=422744">http://rozklad.hneu.edu.ua/schedule/schedule?employee=422744</a></i>
<b>Consultations</b>	<i>in room of department of higher mathematics, economical and mathematical methods, full-time, according to the schedule of consultations, individual</i>
<b>The purpose</b> of the discipline is forming future specialists' mathematical knowledge for solving theoretical and practical economic problems in any sphere of a professional activity	
<b>Prerequisites for learning</b>	
List of previously learned disciplines: Higher mathematics, Probability theory and Mathematical statistics	
<b>Content of the educational discipline</b>	
<b>Content module 1.</b> <i>Basic notions of mathematical modeling of economic systems. Methods of linear programming. Integer programming</i>	
<b>Theme 1. Optimization economic and mathematical methods and models</b>	
<b>Theme 2. Problems of linear programming and methods for solving them</b>	
<b>Theme 3. Duality theory and analysis of linear models of economic optimization problems in international economics</b>	
<b>Theme 4. The transportation problem and its application to international economics</b>	
<b>Theme 5. Integer programming</b>	
<b>Content module 2.</b> <i>Methods of nonlinear and dynamic programming. Game theory. Queuing systems and inventory management</i>	
<b>Theme 6. Nonlinear optimization models of economic systems</b>	
<b>Theme 7. Game theory. Analysis and risk management in international economics on the base of the concept of game theory</b>	
<b>Theme 8. Dynamic programming</b>	
<b>Theme 9. Multicriteria optimization problems and methods for solving them</b>	
<b>Theme 10. Network planning and management methods</b>	
<b>Theme 11. Models of inventory management</b>	
<b>Theme 12. Models of queuing systems</b>	
<b>Material and technical support (software) of the discipline</b>	



*device: multimedia projector; software: MS Excel*

**Course page on the Moodle platform** <https://pns.hneu.edu.ua/course/view.php?id=5366>  
(personal training system)

#### **Assessment system of learning outcomes**

The system of assessment of competences which were formulated for a student during the learning of the academic discipline, takes into consideration the forms of studies which according to the syllabus of the academic discipline is carried out on the accumulative 100-point system.

Current control is carried out within a term during lectures, practical studies and laboratory works in the following forms: homework; defence of laboratory works; written tests; an independent creative work and colloquiums. It is assessed as a sum of accumulative points (the maximum equals 60 points; the minimum which makes it possible for a student to pass an exam, equals 35 points).

Final control is conducted in the form of an exam according to the schedule of the educational process (the maximum is 40 points, the minimum of a quantity, which is passed, equals 25 points).

The final mark of the academic discipline is calculated according to the points obtained during the exam and points obtained during the current control on the accumulative system.

More detailed information on an assessment is given in the working plan (technological card) of the discipline.

#### **Discipline policies**

Teaching discipline is based on the principles of academic integrity. Violations of academic integrity are academic plagiarism, self-plagiarism, fabrication, falsification, write-off, deception, bribery, biased evaluation. For violation of academic integrity, students may be held subject to the following academic liability: re-passing the corresponding educational component of the educational program

*More detailed information about competencies, learning outcomes, teaching methods, assessment forms, independent training is given in the Syllabus (working plan) of the educational discipline (<http://repository.hneu.edu.ua/handle/123456789/26436>).*

Syllabus approved at the meeting of the Department "March 15", 2023. Protocol №10