



Syllabus of the educational discipline « Higher mathematics »

Specialty	<i>121 Software Engineering</i>
Educational program	<i>Software engineering</i>
Educational level	<i>The first (Bachelor) level of higher education</i>
Discipline status	<i>Mandatory</i>
Language of instruction	<i>English</i>
Course / semester	<i>1st year 1st, 2nd semester</i>
Number of ECTS credits	<i>15 credits</i>
Distribution by types of classes and hours of study	<i>Lectures – 56 hours. Practical (seminary) – 56 hours. Laboratory – 56 hours. Self-study – 282 hours.</i>
Form of final assessment	<i>Grading – 1 sem., Grading including Exam – 2 sem</i>
Department	<i>Department of Higher Mathematics and Economic and Mathematical Methods, 61166, Kharkiv, Nauky Av., 9a, Simon Kuznets KhNUE main building, office 329, tel. 057) 702-04-05 (extension tel.: 3-33), web site: http://www.vm.hneu.edu.ua</i>
Teacher (s)	<i>Rybalko Antonina Pavlivna, Associate professor, PhD</i>
Teacher's contacts	<i>Rybalko A.: antonina.rybalko@hneu.net</i>
Days of the classes	<i>Lectures: According to the schedule Practical i: According to the schedule Laboratory: According to the schedule</i>
Consultations	<i>At the Department, in-person, according to the schedule of consultations, individual, chat on the pns web site</i>
The purpose of the discipline: to form in students a holistic system of theoretical and practical knowledge necessary for the professional activity of a competent specialist in the field of information technology	
Prerequisites for learning	
Preliminary knowledge of mathematics in the amount provided by the program of secondary school	
The content of the discipline	
Content module 1. <i>Linear and vector algebras. Analytical geometry</i>	
Theme 1. Matrices and actions with them.	
Theme 2. Determinants of square matrices.	
Theme 3. Systems of linear algebraic equations.	
Theme 4. Vector algebra. Linear m-dimensional spaces.	
Theme 5. Analytical geometry on the plane.	
Theme 6. Analytical geometry in space.	
Content module 2. <i>Differential calculus of a function of one variable</i>	
Theme c 7. The boundary of the function.	
Theme 8. Continuity of the function.	
Theme 9. Derivative and differential function.	
Theme 10. Research of functions and construction of graphs.	
Content module 3. <i>Functions of several variables</i>	
Theme 11. Functions of several variables.	
Theme 12. Extremes of the function of two variables.	
Content module 4. <i>Integral calculus of functions of one and several variables</i>	
Theme 13. Indefinite integral.	
Theme 14. Defined integral.	
Theme 15. Multiple integrals.	
Theme 16. Curvilinear integrals.	
Content module 5. <i>Ordinary differential equations. Rows</i>	
Theme 17. Ordinary differential equations of the 1st order.	
Theme 18. Differential equations of higher orders.	
Theme 19. Systems of linear differential equations.	



Theme 20. Numerical series.
Theme 21. Functional series.

Material and technical support (software) of the discipline

Octave Online, Graph analyzer, CarnoMinimizer.

Course page on the Moodle platform (personal training system)

<https://pns.hneu.edu.ua/>

Learning outcomes assessment system

The system of assessment of the formed competencies takes into account the types of classes, which include lectures, seminars, practical classes, as well as independent work. Assessment of formed competencies in students is carried out on a cumulative 100-point system. The current control carried out during the semester during lectures, practical (seminar) classes, laboratory classes and independent work is assessed by the sum of points scored. In the 1st semester, the maximum amount is 100 points; the minimum amount that allows a student to get credit - 60 points; in the 2nd semester the maximum amount is 60 points; the minimum amount that allows a student to pass the exam is 35 points. The final (semester) control in the 1st semester is carried out in the form of a differentiated test and consists in assessing the level of assimilation of educational material by the student by the sum of points scored on the results of the current control. In the 2nd semester, the final control is conducted in the form of a semester exam, the result of which is evaluated in points (maximum number - 40 points, the minimum number of credits - 25 points).

Current control includes the following control measures: competence-oriented tasks, written tests, independent tests, laboratory work, colloquia, independent creative work.

More detailed information on the assessment and accumulation of points in the discipline is given in the work plan (technological map) of the discipline.

Policies of the Discipline

The teaching of the discipline is based on the principles of academic integrity. Violations of academic integrity include: academic plagiarism, fabrication, falsification, write-off, deception, bribery, or biased evaluation. For violation of academic integrity, students are brought to the following academic responsibility: re-assessment of the relevant type of educational work

More detailed information about competencies, learning outcomes, teaching methods, assessment forms, independent training is given in the working plan of the educational discipline

Syllabus approved at the meeting of the Department. Protocol № 11 from 29.06.2022