



Syllabus of the educational discipline «Higher Mathematics»

Specialty	<i>F2 Software Engineering</i>
Study Programme	<i>Software Engineering</i>
Study cycle (Bachelor, Master, PhD)	<i>the first (Bachelor) level of higher education</i>
Course status	<i>mandatory</i>
Language	<i>English</i>
Term	<i>1st year, 1st and 2nd semesters</i>
ECTS credits	<i>15</i>
Workload	<i>Lectures – 56 hours. Practical studies (seminars) – 56 hours Laboratory studies – 56 hours Self-study – 282 hours.</i>
Assessment system	<i>Grading / Grading including Exam</i>
Department	<i>Department of Economic and Mathematical Modeling, Simon Kuznets KhNUE, room 329 (main building), Phone: +38(057)702-04-05 (or 3-33), website: http://www.vm.hneu.edu.ua/</i>
Teaching staff	<i>Lebediev Stepan Sergovych, Senior Lecturer</i>
Contacts	<i>Stepan.Lebedev@hneu.net</i>
Course schedule	<i>Lectures and practical studies according to the schedule</i>
Consultations	<i>At the Department of Economic and Mathematical Modeling, offline, according to the schedule, individual, PNS chat https://pns.hneu.edu.ua/course/view.php?id=9803</i>

Learning objectives and skills:

formation of a complete system of theoretical knowledge of the mathematical apparatus, which helps to model, analyze and solve economic problems, help in the assimilation of mathematical methods, which make it possible to study and forecast processes and phenomena in the field of future activities of students; the development of logical and algorithmic thinking, the promotion of the formation of skills and abilities of independent analysis of the study of economic problems, the development of the desire to scientifically search for ways to improve one's work.

Structural and logical scheme of the course

Prerequisites	Post-requisites
Assimilation of the material of school courses "Algebra" and "Geometry"	System and business analysis in the IT industry
	Databases
	Algorithms and data structures

Course content

Module 1. Linear and vector algebra. Analytical geometry

Topic 1. Matrices

Topic 2. Determinants

Topic 3. Systems of linear algebraic equations

Topic 4. Vectors. Linear m -dimension spaces.

Topic 5. Analytical geometry on a plane

Topic 6. Analytical geometry in space



Module 2. Differential calculation of functions of one variable

Topic 7. Limits of functions

Topic 8. Continuity of functions

Topic 9. Derivative and differential

Topic 10. Investigation of functions and plotting

Module 3. Functions of several variables

Topic 11. Functions of several variables

Topic 12. Extreme function of two variables

Module 4. Integral calculus functions of one variable

Topic 13. Indefinite integral

Topic 14. Definite integral and its application

Topic 15. Multiple integrals

Topic 16. Curvilinear integrals

Module 5. Differential equations. Series

Topic 17. Differential equations of the first order

Topic 18. Differential equations of higher orders

Topic 19. Systems of linear differential equations

Topic 20. Numerical series

Topic 21. Functional series

Teaching environment (software)

*Multimedia projector, S. Kuznets KhNUE PNS, Corporate Zoom system,
software: MS Excel, Octave Online*

Assessment system

Assessment of students' learning outcomes is carried out by the University according to the cumulative 100-point system.

Current control is carried out during lectures and practical (seminar) classes and aims to assess the level of students' readiness to perform particular tasks, and is assessed by the number of scored points.

The maximum amount during the semester – 100 points; the minimum amount required is 60 points.

Current control includes the following assessment methods: assignments on a particular topic; testing; presentations, and essay writing.

The maximum amount during the semester – 60 points; the minimum amount required is 35 points. Final control is carried out at the end of the semester in the form of an exam (the maximum amount is 40 points, the minimum amount required is 25 points).

Current control includes the following assessment methods: assignments on a particular topic; testing; presentations, and essay writing.

More detailed information on assessment and grading system is given in the technological card of the course.

Course policies

Teaching of the discipline is based on the principles of academic integrity. Violations of academic integrity are: academic plagiarism, fabrication, falsification, write-off, deception, bribery, 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, self-study is given in the Course program

<https://pns.hneu.edu.ua/course/view.php?id=9803>



Simon Kuznets Kharkiv National University of Economics
Faculty of Training of Foreign Citizens