Syllabus of the course

«Higher Mathematics»

Specialty	*121 Software engineering*
Study Programme	*Software engineering*
Study cycle (Bachelor, Master, PhD)	*the first (Bachelor) level of higher education*
Course status	*mandatory*
Language	*English*
Term	*first year, first and second semesters*
ECTS credits	*15*
Workload	*Lectures – 56 hours.*
	Practical studies (seminars) – 56 hours
	Laboratory studies – 56 hours
	Self-study – 282 hours.
Assessment system	*Grading / Grading including Exam*
Department	*Department of Higher Mathematics and Economic Mathematical Methods, Simon Kuznets KNUE, room 329 (main building), Phone: +38(057)702-04-05 (or 3-33), website: http://www.vm.hneu.edu.ua/*
Teaching staff	*Lebediev Stepan Sergovych, Senior Lecturer*
Contacts	*Stepan.Lebedev@hneu.net*
Course schedule	*Lectures: according to the schedule* *Practical studies: according to the schedule*
Consultations	*At the Department of Higher Mathematics and Economic Mathematical Methods, offline, according to the schedule, individual, PNS chat*

Learning objectives and skills:

formation among students a complete system of theoretical and practical knowledge, necessary for the professional activity of a competent specialist in the field of information technology

Structural and logical scheme of the course

Prerequisites	Postrequisites
Assimilation of the material of school courses "Algebra" and "Geometry"	Discrete mathematics
	Algorithms and data structures
	Databases
	Architecture of computers and computer networks
	Databases

Course content

Module 1. *Linear and vector algebra. Analytical geometry*
Topic 1. Matrices and actions with them.
Topic 2. Determinants of square matrices.
Topic 3. Systems of linear algebraic equations.
Topic 4. Vector algebra. Linear *m*-dimention 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 KNUE 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 amount 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 course 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.