



**Syllabus of the educational discipline
«Higher Mathematics»**

| | |
|--|---|
| Specialty | <i>121 Software engineering</i> |
| Educational program | <i>Software engineering</i> |
| Level of education | <i>First (bachelor)</i> |
| Discipline status | <i>Mandatory</i> |
| Teaching language | <i>English</i> |
| Course / semester | <i>1 course, first and second semesters</i> |
| Number of credits ECTS | <i>15</i> |
| Distribution by types of trainings and hours of study | <i>Lectures – 56 hours</i> |
| | <i>Practical studies (seminars) – 56 hours</i> |
| | <i>Laboratory studies – 56 hours</i> |
| | <i>Independent training – 282 hours</i> |
| Form of final assessment | <i>Grading, Grading including Exam</i> |
| Department | <i>Department of Higher Mathematics and Economics and Mathematical Methods, S. Kuznets Kharkov National University of Economics, main building, room 329. Phone +38(057)702-04-05 (or 3-33), http://www.vm.hneu.edu.ua/</i> |
| Teacher | <i>Stiepanova Kateryna Vadumivna, associate professor of department of HM and EMM, PhD</i> |
| Teacher's contacts | <i>stepanova.ekaterina@hneu.net</i> |
| Days of the classes | <i>Monday, Tuesday, Wednesday, Friday</i> |
| Consultations | <i>According to the consultations schedule.</i> |
| <p>The purpose of the discipline is forming future specialists' basic mathematical knowledge for solving theoretical and practical problems in professional activity of competent specialist in a service sphere, skills of analytical thinking and skills of using mathematical knowledge for formation of real processes and developments, and for solving economic problems.</p> | |
| <p>Prerequisites for learning <i>High School Mathematics Course</i></p> | |
| <p>Content of the educational discipline</p> <p>Content module 1. Linear and vector algebra. Analytical geometry</p> <p>Theme 1. Matrices</p> <p>Theme 2. Determinants</p> <p>Theme 3. Systems of linear algebraic equations</p> <p>Theme 4. Vectors. Linear m - dimation spaces.</p> <p>Theme 5. Analytical geometry on a plane</p> <p>Theme 6. Analytical geometry in space</p> <p>Content module 2. Differential calculation of functions of one variable</p> <p>Theme 7. Limits of functions</p> <p>Theme 8. Continuity of functions</p> <p>Theme 9. Derivative and differential</p> <p>Theme 10. Investigation of functions and plotting</p> <p>Content module 3. Functions of several variables</p> <p>Theme 11. Functions of several variables</p> <p>Theme 12. Extreme function of two variables</p> <p>Content module 4. Integral calculus functions of one variable</p> <p>Theme 13. Indefinite integral</p> <p>Theme 14. Definite integral and its application</p> <p>Theme 15. Multiple integrals</p> | |



Theme 16. Curvilinear integrals

Content module 4. Differential equations. Series

Theme 17. Differential equations of the first 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

MatLab (Octave)

**Course page on the Moodle platform
(personal training system)**

Work program of the discipline, work plan (technological card), hyperlinks to electronic publications of the discipline, recommended literature, students' attendance, lecture materials, presentations, questions for self-control, methodical materials for seminars and laboratory works, tests, task for checking students' knowledge, COTasks, examples of control works, example of examination paper and criteria
<https://pns.hneu.edu.ua/>

Recommended literature

1. Вища математика: математичний аналіз, лінійна алгебра, аналітична геометрія : підручник / [авт. кол. : Пономаренко В. С., Малярець Л. М., Афанасьєва Л. М. та ін. ; за ред. В. С. Пономаренка]. – Мультимедійне інтерактивне електрон. вид. комбінованого використ. (412 Мб). – Харків: ХНЕУ ім. С. Кузнеця, 2015.
http://library.hneu.edu.ua/jornal_aut1.php
2. Бузько Я. П. Вища математика. Ч. 1 / Я. П. Бузько, В. Ф. Сенчуков, В. Г. Тімарев. –Х. : ХДЕУ, 1996. – 136 с.
3. Вища математика. Збірник задач : навч. посібн. / В. П. Дубовик, І. І. Юрик, І. П.Вовкодав та ін. ; за ред. В. П. Дубовика, І. І. Юрика. – К. : Вид. А.С.К., 2003. – 480 с.
4. Вища математика: основні означення, приклади і задачі : навч. посібн. Кн. 2 / І. П. Васильченко, В. Я. Данилов, А. І. Лобанов та ін. – К. : Либідь, 1994. – 480 с.
5. Математика для економістів : збірник вправ / укл. Л. М. Афанасьєва, Г. К.Снурнікова, Л. Д. Широкопад. – Х. : ХДЕУ, 2001. – 60 с.
6. Травкін Ю. І. Математика для економістів : підручник / Ю. І. Травкін, Л. М.Малярець. – Х. : ВД „ІНЖЕК”, 2005. – 816 с.
7. Фихтенгольц Г. М. Курс дифференциального и интегрального исчисления. Т. 1 /Г. М. Фихтенгольц – Л. : Физматгиз, 1962. – 608 с.
8. Шкіль М. І. Математичний аналіз. Ч. 1 / М. І. Шкіль. – К. : Вища шк., 1994. – 424 с.

Assessment system of learning outcomes

Current control carried out during semester (during lectures, seminars and laboratory works) and evaluated by the amount of points (max is 100 points). A minimum amount, that allows a student to get credit is 60 in the first semester (max is 100 points). A minimum amount is 35 points in the second semester (max is 60 points) that allows a student to take an exam. Final (semester) control is carried out in the form of credit(first semester) and in the form of exam (second semester) and evaluated in points (max is 40 points, min is 25 points)

More detailed information on assessment is given in the technological card of the discipline.



| Accumulation of rating points in the discipline | | | |
|---|-----------------------|--|------------------------|
| Types of training | | Maxpoints (1 semester) | Maxpoints (2 semester) |
| Homework | | 11 | |
| Laboratory works | | 24 | 8 |
| Independent control works | | 12 | 8 |
| Written Control works | | 14 | 12 |
| Colloquiums | | 14 | 12 |
| Independent creative work | | 7 | 7 |
| Competent-oriented Tasks | | 18 | 13 |
| Exam (if available) | | | 40 |
| Max points | | 100 | 100 |
| Transference of Simon Kuznets KHNUE Characteristics of Students' Progress into the System of the ECTS Scale | | | |
| Total score on a 100-point scale | ECTS assessment scale | Assessment on the national scale | |
| | | for exam, differentiated test, course project (work), practice, training | for pass |
| 90 – 100 | A | excellent | pass |
| 82 – 89 | B | good | |
| 74 – 81 | C | satisfactory | |
| 64 – 73 | D | | |
| 60 – 63 | E | unsatisfactory | not pass |
| 35 – 59 | FX | | |
| 1 – 34 | F | | |

Discipline policies

Policy of academic integrity according to the Law of Ukraine " About Education" tells that teaching discipline should be based on the principles of academic integrity, they are a set of ethical principles and statutory rules that should guide participants in the educational process during training, teaching, conducting scientific (creative) activities to ensure confidence in learning outcomes and scientific (creative) achievements. 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: reassessment (test, exam, etc.); re-passing of the relevant educational component of the educational program. Rewriting during control is prohibited (including with using electronic devises)

<https://www.hneu.edu.ua/akademichna-dobrochesnist/>

More detailed information about competencies, learning outcomes, teaching methods, assessment forms, independent training is given in the Program and Technological Card of the educational discipline "Higher Mathematics I" and "Higher Mathematics II".

Syllabus approved at the meeting of the Department «Higher Mathematics and Economics and Mathematical Methods» Protocol № 1 from 20.09.2020