Ministry of Education and Science of Ukraine
Sumy National Agrarian University
Faculty of Food Technologies
Department of Higher Mathematics and Physics

Work program (syllabus) of the educational component EC6 "Higher Mathematics" (mandatory)

Implemented within the educational program:
educational and professional program " Food Technologies "

in the specialty G13 "Food Technologies"

at the first (bachelor's) level of higher education

Sumy – 2026

Developer: _____ **Borozenets N.S., Candidate of Pedagogical Sciences, Associate Professor**

Considered, approved and ratified at a meeting of the Department of Higher Mathematics and Physics	minutes of 02.06.2026 № 13
	Head of the Department _____ Gerasimenko V. O.

Agreed:

Educational Program Guarantor _____ (signature) Olena KOSHEL (Full name)

Dean of the faculty where the educational program is implemented _____ (signature) _____ (Full name)

Review of the work program (attached) provided: _____ (Full name)

_____ (Full name)

Methodologist of the Department of Educational Quality, Licensing and Accreditation _____ (signature) (N. Banakh) (Full name)

Registered in the electronic database: date: 24.06 2026

Information on reviewing the work program (syllabus):

Academic year in which changes are made	Number of the appendix to the work program with a description of the changes	Changes reviewed and approved		
		Date and number of the minutes of the department meeting	Head of the Department	Educational program guarantor

1. GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT

<table>
<tr><td>1</td><td>Name of the EC</td><td colspan="3">EC6 "Higher Mathematics"</td></tr>
<tr><td>2</td><td>Faculty/department</td><td colspan="3">Faculty of Food Technology
Department of Higher Mathematics and Physics</td></tr>
<tr><td>3</td><td>Status EC</td><td colspan="3">Mandatory</td></tr>
<tr><td>4</td><td>Program/Specialty (programs) of which the EC is a component (to be filled in for mandatory EC)</td><td colspan="3">educational and professional program " Food Technologies " in the specialty G13 "Food Technologies"</td></tr>
<tr><td>5</td><td>The EC may be proposed for (to be filled in for selective EC)</td><td colspan="3"></td></tr>
<tr><td>6</td><td>NQF level</td><td colspan="3">6 level</td></tr>
<tr><td>7</td><td>Semester and duration of study</td><td colspan="3">1 semester, 15 weeks</td></tr>
<tr><td>8</td><td>Number of ECTS credits</td><td colspan="3">5</td></tr>
<tr><td rowspan="3">9</td><td rowspan="3">Total number of hours and their distribution (full-time study)</td><td colspan="2">Contact work (classes)</td><td>Independent work</td></tr>
<tr><td>Lectures</td><td>Practical</td><td rowspan="2">90</td></tr>
<tr><td>30</td><td>30</td></tr>
<tr><td>10</td><td>Language of instruction</td><td colspan="3">Ukrainian</td></tr>
<tr><td>11</td><td>Teacher</td><td colspan="3">Borozenets Nataliia Serhiivna</td></tr>
<tr><td>12</td><td>Contact information</td><td colspan="3">bnataliya3009@gmail.com</td></tr>
<tr><td>13</td><td>General description of the educational component</td><td colspan="3">The course provides knowledge of linear algebra, analytical geometry, mathematical analysis (differential and integral calculus, differential equations). The course allows you to gain practical skills in solving systems of linear algebraic equations, analytical modeling of simple geometric shapes, the application of differential and integral calculus in the analysis of functional dependence, and solving differential equations.</td></tr>
<tr><td>14</td><td>Purpose of the educational component</td><td colspan="3">The goal is to help students acquire basic mathematical knowledge and skills necessary for solving problems in their professional activities, to provide specialized academic disciplines with the necessary mathematical apparatus; to develop students' logical and algorithmic thinking; and to form a scientific worldview.</td></tr>
<tr><td>15</td><td>Prerequisites for studying EC, connection with other educational components of EP</td><td colspan="3">The educational component is based on the mathematics course studied in high school.
The educational component is the basis of modern abstract mathematical thinking, mathematical culture and provides the necessary knowledge and skills for mastering professional disciplines.
No restrictions</td></tr>
<tr><td>16</td><td>Academic Integrity Policy</td><td colspan="3">All individual and independent work is checked for academic integrity. Cheating during tests and exams is prohibited (including using mobile devices).
Attendance at classes is a mandatory component of the assessment, for which points are awarded. For objective reasons (e.g. illness, international internship), training may take place online (blended</td></tr>
</table>

		form of learning) in agreement with the course leader.
17	Keywords	Higher mathematics, learning outcomes, students, educational component, methods, assessment
18	Link to the course in Moodle	https://cdn.snau.edu.ua/moodle/course/view.php?id=562

2. LEARNING OUTCOMES BY EDUCATIONAL COMPONENT AND THEIR RELATIONSHIP WITH PROGRAM LEARNING OUTCOMES

Learning outcomes for EC: «After studying the educational component, the student is expected to be able to…»	Program learning outcomes that the EC aims to achieve (indicate the number according to the numbering given in the EP)		How is DLO assessed?
	PLO4	PLO18	
DLO1. Perform matrix addition and multiplication operations; calculate determinants of the 2nd and 3rd order, solve systems of linear equations using Cramer's formulas and Gauss's method; calculate scalar, vector and mixed products of vectors. Solve basic problems on a line and a plane: points of intersection, conditions of parallelism and perpendicularity, finding distances from a point to a line or plane. Apply the acquired knowledge when solving problems of an applied nature.	+	+	Tests, tasks, questions
DLO2. Find the limits of functions, investigate their continuity. Calculate the derivatives of functions according to the rules of differentiation of sum, product, quotient; according to L'Hôpital's rule; conduct research on functions using the first and second derivatives; find and depict on the plane the region of permissible values of a function of two independent variables; calculate partial derivatives of a function of two variables of the first and second order. Expand knowledge of differential calculus. Form the concept of the economic, geometric and mechanical content of the derivative. Teach how to find the relationship between the change in a process component and the process itself.	+	+	Tests, tasks, questions
DLO3. Calculate indefinite integrals by substitution and by parts; decompose fractions into sums of elementary fractions and integrate elementary fractions of type I-III; calculate definite integrals using the Newton-Leibniz formula; perform variable substitution in a definite integral. Know and be able to apply the basic formulas for calculating the areas of plane figures, for various methods of defining a curve, volume and surface area of solids of revolution, the length of the arc of a curve, the coordinates	+	+	Tests, tasks, questions

of the center of gravity of a flat plate. Be able to apply the definite integral to economic calculations.			
DLO4. Know the basic concepts of the topic "Differential equations". Distinguish between types of differential equations, know what substitution needs to be performed, be able to reduce the resulting equation to an equation with separated variables. Be able to solve second-order differential equations: incomplete, linear with constant coefficients. Be able to apply differential equations when solving professional problems.	+	+	Tests, tasks, questions

3. CONTENT OF THE EDUCATIONAL COMPONENT (COURSE PROGRAM)

Topic. List of issues to be considered within the topic	Distribution within the overall time budget			Recommended reading
	Contact work		Independent work	
	Lect	Pract		
Topic 1. Linear algebra. Systems of linear algebraic equations with two and three variables and, accordingly, with two and three equations. Determinants of the second and third orders. Cramer's rule. Matrices, actions on matrices. Inverse matrix. Solving systems of linear equations by the matrix method. Matrix rank, Kronecker-Capelli theorem. Solving systems of linear equations by the Gauss method.	2	2	8	1.1.; 1.3.; 1.4.; 1.5.; 1.7.; 2.1.; 2.2.; 3.1.; 3.2.; 3.3.
Topic 2. Vector algebra. Vectors. Linear operations on vectors. Linear space. Linearly dependent and linearly independent vector systems. Basis and dimension of linear space. Basis on the plane and in space. Affine coordinate system. Cartesian coordinate systems as a special case of affine coordinate systems. Division of a segment in this relation. Scalar product of two vectors. Properties of the scalar product. Expression of the scalar product in terms of coordinates. Angle between two vectors. Direction cosines. Orthogonality of vectors. Vector product of two vectors. Properties of the vector product. Expression of the vector product in terms of coordinates. Conditions for collinearity of vectors. Application of the vector product. Mixed product of three vectors. Properties of the mixed product of vectors. Expression of the mixed product in terms of coordinates. Conditions for coplanarity of vectors. Application of the	2	4	8	1.1.; 1.3.; 1.4.; 1.5.; 1.7.; 2.1.; 2.2.; 3.1.; 3.2.; 3.3.

mixed product of vectors.				
Topic 3. Analytical geometry. Equation of a line on a plane. Equation of a surface and a line in space. Line on a plane. Equation of a line on a plane. Angle between lines, conditions of parallelism and perpendicularity. Normalized equation of a line. Distance from a point to a line. Plane. Equation of a plane. Angle between planes. Conditions of parallelism and perpendicularity. Normalized equation of a plane. Distance from a point to a plane. Line in space. Equation of a line in space. Angle between lines. Conditions of parallelism and perpendicularity of lines. Line and plane in space. Angle between a line in space and a plane. Conditions of parallelism and perpendicularity of a line and a plane. Curves of the second order. Canonical equation of an ellipse, hyperbola, parabola, study of their form, properties. General equation of a curve of the second order, its reduction to canonical form. Technical application of geometric properties of curves.	4	2	8	1.1.; 1.3.; 1.4.; 1.5.; 1.7.; 2.1.; 2.2.; 3.1.; 3.2.; 3.3.
Topic 4. Introduction to mathematical analysis. Fundamentals of set theory. The concept of a set, its element. Actions on sets. Bounded numerical sets, upper and lower bounds of a bounded numerical set. Set of complex numbers. Functional dependence. The concept of a function of one variable. Methods of defining functions. Certain special classes of functions. Inverse function. Sequence. Limit of a sequence. Excellent limit. Limit of a function at a point. Properties of the limit. Infinitely small and infinitely large functions at a point and their comparison. Continuity of a function at a point. One-sided continuity. Points of discontinuity and their classification. Properties of functions continuous on a segment.	4	4	10	1.1.; 1.3.; 1.4.; 1.5.; 1.6.; 1.7.; 2.1.; 2.5.; 3.1.; 3.2.; 3.3.
Topic 5. Differential calculus of a function of one variable. Derivative of a function, geometric and mechanical meaning. Basic theorems on the derivative of a function. Derivatives of basic elementary functions. Table of derivatives. Derivatives of higher orders. Theorems about the mean. L'Hôpital's rules. Taylor's formula. Differentiability of a function.	4	4	8	1.1.; 1.3.; 1.4.; 1.5.; 1.6.; 1.7.; 2.1.; 2.3.; 3.1.; 3.2.; 3.3.

Continuity of a differentiable function. Geometric meaning of a differential. Application of differentials during approximate calculations. Higher-order differentials. Derivatives of parametric functions. Growth and decrease of a function at a point. Sufficient condition for growth and decrease of a function at a point. Extremum points. Theorem on the necessary condition for the existence of extremum points. Stationary and critical points. Sufficient conditions for the existence of extremum points. The largest and smallest value of a continuous function on a segment. Convexity of the graph of a function. Inflection points. Necessary condition for the existence of inflection points. Sufficient conditions. Asymptotes. Inclined asymptotes. General scheme of studying a function and constructing its graph.				
Topic 6. Functions of several variables. Differential calculus of functions of several variables. Function of several variables. Lines and level surfaces. Limit of a function at a point. Continuity of a function at a point. Properties of continuous functions. Partial derivatives. Differentiability of functions. Complete differential. Partial derivatives of higher orders. Derivative in a given direction, gradient. Extremum of a function of two variables. Necessary condition for the existence of extremum points. Sufficient condition. Conditional extremum.	2	2	8	1.1.; 1.5.; 1.7.; 2.1.; 2.4.; 3.1.; 3.2.; 3.3.
Topic 7. Integral calculus of a function of one variable. Indefinite integral. Concept of antiderivative function and indefinite integral. Basic properties of indefinite integrals. Table of indefinite integrals. Basic integration methods. Method of dividing the integral, replacing the variable, integration by parts. Integration of rational functions. Decomposition of proper rational fractions into the sum of elementary fractions. Integration of elementary fractions. Integration of some irrational functions. Integration of some trigonometric functions.	4	4	8	1.1.; 1.3.; 1.4.; 1.5.; 1.6.; 1.7.; 2.1.; 2.3.; 3.1.; 3.2.; 3.3.
Topic 8. Definite integral and its applications. Problems that lead to the concept of a definite integral. Definite integral under the condition of its existence.	2	2	8	1.1.; 1.3.; 1.4.; 1.5.; 1.6.; 1.7.; 2.1.; 2.3.; 3.1.; 3.3.

Properties of definite integrals. Integral with a variable upper limit. Newton-Leibniz formula. Methods of calculating definite integrals. Approximate methods of calculating definite integrals. Improper integrals with infinite limits and from unbounded functions. Applications of definite integrals. Geometric, mechanical, physical				
Topic 9. Integral calculus of functions of two variables. Double integral and conditions for its existence. Calculation of double integrals. Double integral in polar coordinates. Application of double integrals.	0	0	8	1.6.; 1.7.; 3.1
Topic 10. Ordinary differential equations. First-order differential equations. The concept of a differential equation and its solutions. 1st-order differential equations solved with respect to the derivative and their geometric meaning. Cauchy's problem. Cauchy's theorem. General solution and general integral. 1st-order equations that integrate in quadratures. Equations with separable variables, homogeneous, linear, Bernoulli equations, equations in complete differentials.	4	4	8	1.2.; 1.3.; 1.4.; 1.5.; 1.7.; 2.1.; 2.4.; 2.5.; 3.1.; 3.2.; 3.3.
Topic 11. Higher-order differential equations. Higher-order differential equations. Cauchy's problem. Cauchy's theorem. Some classes of differential equations that integrate in quadratures or allow reduction of order. Linear differential equations of the second order. Linear differential equations of the second order with constant coefficients (homogeneous and inhomogeneous with a special right-hand side). Higher-order differential equations, systems of differential equations. Solving systems of linear differential equations with constant coefficients.	2	2	8	1.2.; 1.3.; 1.4.; 1.5.; 1.7.; 2.1.; 2.4.; 2.5.; 3.1.; 3.2.; 3.3.
Total	30	30	90	

4. TEACHING AND LEARNING METHODS

DLO	**Teaching methods (**work that will be carried out by the teacher during classroom lessons, consultations)	Number of hours	**Teaching methods** (what types of learning activities the student should perform independently)	Number of hours
1. Perform the operations of addition and multiplication of	Lectures (introductory, thematic, mini-	16	Studying educational material using	24

matrices; calculate determinants of the 2nd and 3rd order, solve systems of linear equations using Cramer's formulas and the Gauss method; calculate scalar, vector and mixed products of vectors. Solve basic problems on a line and a plane: points of intersection, conditions of parallelism and perpendicularity, finding distances from a point to a line or plane. Apply the knowledge gained when solving problems of an applied nature.	lectures); practical classes (modular, contextual, problem-based learning, complete assimilation of knowledge, distance learning); problem-based presentation of educational material, practical methods (exercises).		textbooks and Internet resources; completing typical graphic and individual tasks; preparing for modular control.	
2. Find the limits of functions, investigate their continuity. Calculate the derivatives of functions according to the rules of differentiation of sum, product, quotient; according to L'Hôpital's rule; conduct research on functions using the first and second derivatives; find and depict on the plane the region of permissible values of a function of two independent variables; calculate partial derivatives of functions of two variables of the first and second order. Expand knowledge of differential calculus. Form the concept of the economic, geometric and mechanical content of the derivative. Teach how to find the relationship between the change in a process component and the process itself.	Lectures (thematic, mini-lectures); practical classes (modular, contextual, problem-based learning, complete assimilation of knowledge, distance learning); problem-based presentation of educational material, research method, practical methods (exercises).	20	Studying educational material using textbooks and Internet resources; completing typical graphic and individual tasks; preparing for modular control.	26
3. Calculate indefinite integrals by substitution and by parts; decompose fractions into sums of elementary fractions and integrate elementary fractions of type I-III; calculate definite integrals using the Newton-Leibniz formula; perform variable substitution in a definite integral. Know and be able to apply the basic formulas for calculating the areas of plane figures, for various methods of defining a curve, volume and surface area of bodies of revolution, the length of the arc of	Lectures (thematic, mini-lectures); practical classes (modular, contextual, problem-based learning, complete assimilation of knowledge, distance learning); problem-based presentation of educational material, research method, practical methods (exercises).	12	Studying educational material using textbooks and Internet resources; completing typical graphic and individual tasks; preparing for modular control.	24

a curve, the coordinates of the center of gravity of a flat plate. Be able to apply the definite integral to economic calculations.				
4. Know the basic concepts of the topic "Differential equations". Distinguish between types of differential equations, know what substitution needs to be performed, be able to reduce the resulting equation to an equation with separated variables. Be able to solve second-order differential equations: incomplete, linear with constant coefficients. Be able to apply differential equations when solving professional problems.	Lectures (problem, thematic, mini-lectures); practical classes (modular, contextual, problem-based learning, complete assimilation of knowledge, distance learning); problem-based presentation of educational material, research method, project method, practical methods (exercises).	12	Studying educational material using textbooks and Internet resources; completing typical graphic and individual tasks; preparing for modular control.	16

5. ASSESSMENT BY EDUCATIONAL COMPONENT

5.1. Diagnostic assessment (indicated as necessary)

5.2. Summative assessment

5.2.1. For the assessment of expected learning outcomes, the following is provided

№	Summative assessment methods	Points / Weight in the overall score	Date of compilation
1.	Module 1 1.1. Test (topics 1-2) – 12 points/12% 1.2. Independent work (topic 3) – 11 points/11% 1.3. Test (topic 4) – 12 points/12%	35/35%	8 week
2.	Module 2 2.1. Test (topics 5-6) – 11 points/11% 2.2. Test (topics 7-9) – 12 points/12% 2.3. Test (topics 10-11) – 12 points/12%	35/35%	15 week
3.	Exam 3.1. Testing (multiple choice test) - 18 points/ 18% 3.2. Problem solving (3 problems of 4 points each) - 12 points/12%	30/30%	

5.2.2. Evaluation criteria

Component	Unsatisfactorily	Satisfactorily	Good	Perfectly
Module 1	<20 points	21-26 points	27-31 points	32-35 points
	Module requirements not met.	Most requirements are met, but ndividual components are missing or not sufficiently disclosed, not all tasks are solved	All module requirements met	All module requirements were met, creativity and thoughtfulness were demonstrated, and all tasks were solved.
Module 2	<20 points	21-26 points	27-31 points	32-35 points
	Module requirements not met..	Most requirements are met, but ndividual components are	All module requirements met	All module requirements were met, creativity and

		missing or not sufficiently disclosed, not all tasks are solved		thoughtfulness were demonstrated, and all tasks were solved.
Exam	<18 points	18-23 points	24-26 points	27-30 points
	The answers to the tests are given incorrectly, the problems are not solved.	The answers to the tests are given correctly, the problems are not solved or there are incorrect answers, but at least one problem is solved.	The answers to the tests are given correctly, at least one problem is solved, but there are inaccuracies in the solution.	The answers to the tests are given correctly, all the problems are solved.

5.3. Formative assessment:

To assess current progress in learning and understand areas for further improvement

№	Elements of formative assessment	Date
1	Keeping lecture notes	During the lecture
2	Express polls during lectures	At the end of the lecture
3	Oral questioning in practical classes	At the beginning or end of the practical session
4	Written independent work (solving problems/surveys) based on the material from the previous practical session	At the beginning of the practical session
5	Written feedback from the teacher based on the results of the student's independent work on each topic	Within 1 week of studying a specific topic
№	**Elements of formative assessment**	**Date**
1	Modular control 1 (test work)	8 week
2	Modular control 2 (test work)	15 week
3	Exam (written)	During the session

6. LEARNING RESOURCES (LITERATURE):

Textbooks, manuals:

1.1 Barkovsky V.M. Higher Mathematics: Practicum. 2023, 536 p.

1.2 Borozenets N.S., Gerasimenko V.O. Higher Mathematics. Textbook. 2025. 242 p.

1.3 Higher Mathematics in Examples and Problems/ Viktor Klepko, Valentina Golets. 2020. 594 p.

1.4 Higher Mathematics: a textbook for bachelor's degree applicants in engineering specialties / M. E. Dudkin, O. Yu. Dyuzhenkova, I. V. Stepakhno; Igor Sikorsky Kyiv Polytechnic Institute. Kyiv: Igor Sikorsky Kyiv Polytechnic Institute, 2022. 449 p.

1.5 Dolya O.V., Turchaninova L.I. Higher Mathematics in Examples and Problems. 2021. 348 p.

1.6 Skuratovsky R. V. Higher Mathematics with Examples and Problems. Textbook. K.: National Academy of Management, 2021. 232 p.

1.7 Panchenko N. G., Rezunenko M. Ye. Higher Mathematics: Textbook. Kharkiv: UkrDUZT, 2022. Part 1. 231 p.

Methodological support:

2.1. Borozenets N.S. HIGHER MATHEMATICS. Lecture notes for first-year students of educational programs “Food Technologies”, “Craft Technologies and Gastronomic Innovations”, “Hotel and Restaurant Business” of full-time and part-time forms of obtaining higher education with the degree of “Bachelor”. Sumy, 2026. 114 p.

2.2. Borozenets N.S. Higher Mathematics. Integral calculus of a function of one variable. Solver for practical classes and independent work of first-year students of engineering and technological specialties of full-time and part-time forms of study / Sumy: SNAU, 2022. 62 p.
2.3. Higher Mathematics. Differential Equations. Practical course for first-year students of engineering and technological specialties of full-time and part-time forms of study // Incl.: Borozenets N.S., Pugach V.I. Sumy: SNAU, 2018. 42 p.
2.4. Borozenets N.S. Higher Mathematics. Differential Equations. Solver for practical classes and independent work of 1st year students of engineering, technical and technological specialties of full-time and part-time study / Sumy: SNAU, 2023. 44 p.
2.5. Borozenets N.S. Higher Mathematics. Introduction to Mathematical Analysis. Solver for practical classes and independent work of 1st year students of engineering, technical and technological specialties of full-time and part-time study / Sumy: SNAU, 2024. 30 p.

3.1. http://dspace.tneu.edu.ua/bitstream/316497/612/1/vm_pidr.pdf
3.2. https://studfile.net/preview/5393268/
3.3. http://univer.nuczu.edu.ua/tmp_metod/148/Basmanov.pdf

7. ARTICLES:

1. Борозенець Н. С. Використання частково-пошукового та пошукового методів навчання у процесі вивчення математичних дисциплін в аграрних ЗВО. *Науковий вісник Ужгородського університету. Серія: «Педагогіка. Соціальна робота»*. Випуск 1 (50), 2022, С. 23-27. DOI 10.24144/2524-0609.2022.50.23-26
2. Борозенець Н.С. Сутність і структура дослідницької компетентності бакалаврів з аграрних наук у процесі вивчення математичних дисциплін. *Освіта. Інноватика. Практика*. Том 10, № 7. С. 13-18. DOI: 10.31110/2616-650X-vol10i7-002
3. Борозенець Н. С. Критерії та показники сформованості дослідницької компетентності студентів аграрних ЗВО. *Вісник КрНУ імені Михайла Остроградського*. 2023, №1 (138). С. 120-125. DOI: 10.32782/1995-0519.2023.1.17
4. Борозенець Н. С. Роль самоосвітньої компетентності у професійному розвитку майбутніх фахівців аграрного профілю. *Наукові записки. Серія: Педагогічні науки*. 2024. №7. С. 77-81 DOI: 10.59694/ped_sciences.2024.07.077
5. Борозенець Н. С. Використання проблемного методу навчання у процесі вивчення математичних дисциплін в аграрних ЗВО. *Науковий вісник Південноукраїнського національного педагогічного університету імені К. Д. Ушинського.* 2024. №2 (147). С. 56-61. DOI: https://doi.org/10.24195/2617-6688-2024-1-8
6. Борозенець Н.С., Котелевець С.О. Міждисциплінарні зв'язки як засіб формування самоосвітньої компетентності майбутніх фахівців-аграріїв. *Наукові записки. Серія: Педагогічні науки*. 2025. №217. С 90-93. DOI: https://doi.org/10.36550/2415-7988-2025-1-217-90-93
7. Борозенець Н.С. Інноваційна компетентність як компонент професійної діяльності майбутніх фахівців-аграріїв. *Наукові записки. Серія: Педагогічні науки*. 2025. №11. С. 68-72. DOI: https://doi.org/10.59694/ped_sciences.2025.11.068
8. Борозенець, Н. (2026). Методичні аспекти використання прикладних задач у розвитку критичного мислення здобувачів освіти аграрних ЗВО. *Наукові записки. Серія: Педагогічні науки*, (222), 366-370. https://doi.org/10.36550/2415-7988-2026-1-222-366-370
9. Борозенець, Н. С. (2026). Роль математичних дисциплін у розвитку критичного мислення здобувачів освіти аграрних ЗВО. *Наукові записки. Серія "Психолого-*

педагогічні науки" (Ніжинський державний університет імені Миколи Гоголя), (1), 95–102. https://doi.org/10.31654/2663-4902-2026-PP-1-95-102