CONTENT

1. OPTIONAL COMPONENTS OF THE CYCLE OF CORE COURSES

Optional component 1

Course: **MPM 501/1 Innovative methods of teaching mathematics in higher school**
Intensity of the Course: 5 academic credits
Module Code: MPM-2
Module Name: Mathematics and problems of teaching mathematics
Prerequisites: Methods of teaching mathematics in basic school
Purpose and short description: The purpose of the discipline is the formation of skills to develop and implement methodological models, methods, technologies and techniques of teaching mathematics, the ability to analyze the results of the process of their use in educational institutions of various types.

Undergraduates will be able to:

– design new curricula and develop innovative methods of organizing the educational process, criteria for innovative processes in mathematical education

– plan the innovation process, develop a portfolio of innovations and innovations in the subject area "Mathematics" in order to ensure the competitiveness of the organization, evaluate innovative ideas based on existing criteria; develop an innovative program for the development of the institution, its resource provision.

Learning Outcomes in EP (LOP):

LOP 2 – knows the theoretical and methodological foundations of the development of psychological and pedagogical science, teaching methods, the role and content of psychological and pedagogical research and is able to apply them in professional activities.

LOP 3 – performs research activities using modern scientific methods and programs for statistical processing of research results.

LOP 5 – develops the structure and content of academic disciplines, using knowledge of mathematics and methods of teaching mathematics, forms and methods of control and control and measuring materials that ensure the quality of the educational process.

Learning Outcomes in Course (LOC):

LOC 1 – understands the role of introducing innovative teaching methods in teaching mathematics in higher education;

LOC 2 – ready to use innovative teaching methods in the organization of the educational process in higher education;

LOC 3 – owns various methodological techniques necessary for analyzing the results of the process of applying modern methods, technologies and teaching methods.

Post requisites: DTE 602/1 Development of elective courses in mathematics

Optional component 2

Course: **MPM 501/2 Organization of training with STEM elements**
Intensity of the Course: 5 academic credits
Module Code: MPM-2
Module Name: Mathematics and problems of teaching mathematics.
Prerequisites: Methods of teaching mathematics in basic school, Physics, Information and Communication Technologies.
Purpose and short description: The purpose of the subject is the formation of skills of working with students in the development of the ability to see the inextricable relationships in the surrounding reality, the value of scientific knowledge for life.

Undergraduates will be able to:

– integrate theoretical knowledge in mathematics with practical application in solving specific problems;

– organize and conduct classes with STEM elements, using interdisciplinary connections of mathematics with other subject areas

Learning Outcomes in EP (LOP):

LOP 5 – develops the structure and content of academic disciplines, using knowledge of mathematics and methods of teaching mathematics, forms and methods of control and control and measuring materials that ensure the quality of the educational process.

LOP 6 – develops educational resources, designs and implements offline and online learning through the organization of individual or team work using digital technologies.

LOP 7 – evaluates students' academic achievements and determines ways to improve them based on the results of scientific research of the educational process and using various means and technologies for evaluating learning outcomes.

LOP 8 – forms students' stable motivation to study mathematics throughout their lives using a personality–oriented approach.

Learning Outcomes in Course (LOC):

LOC 1 – uses fundamental knowledge to organize the construction of STEM classes;

LOC 2 – develops tasks in order to implement the STEM approach;

LOC 3 – selects the content, methods and technologies of learning for the implementation of the STEM approach

Post requisites: DTE 602/1 Development of elective courses in mathematics.

Optional component 3

Course: **MPM 502/1 Mathematical thinking and its development**

Intensity of the Course: 5 academic credits

Module Code: MPM-2

Module Name: Mathematics and problems of teaching mathematics

Prerequisites: Methods of teaching mathematics in basic school

Purpose and short description: The purpose of the discipline is to develop skills of working with children in order to develop their mathematical abilities.

Undergraduates will be able to:

– explain the process of representation, analysis, generalization and abstraction of mathematical concepts in students;

– to develop educational materials that contribute to students' understanding of the conceptual definition of concepts using knowledge about mathematical thinking, heuristic techniques and ways of its development in schoolchildren when teaching mathematics and compensating for its limitations.

Learning Outcomes in EP (LOP):

LOP 6 – develops educational resources, designs and implements offline and online learning through the organization of individual or team work using digital technologies.

LOP 7 – evaluates students' academic achievements and determines ways to improve them based on the results of scientific research of the educational process and using various means and technologies for evaluating learning outcomes.

LOP 8 – forms students' stable motivation to study mathematics throughout their lives using a personality–oriented approach.

Learning Outcomes in Course (LOC):

LOC 1 – has knowledge of mathematical thinking, heuristic techniques and ways of its development in schoolchildren when teaching mathematics and compensating for its limitations;

LOC 2 – creates conditions for the development of students' creative abilities, intuition in mathematical research when studying specific topics of the school mathematics course.

LOC 3 – plans and implements activities to form a positive attitude to mathematics.

Post requisites: TMS 501/1 Theoretical foundations of teaching mathematical problem solving

Optional component 4

Course: **MPM 502/2 Organization of project activities in mathematical disciplines**

Intensity of the Course: 5 academic credits

Module Code: MPM-2

Module Name: Mathematics and problems of teaching mathematics

Prerequisites: Methods of teaching mathematics in basic school

Purpose and short description: The purpose of the discipline is to form the skills of organizing the work of schoolchildren in the implementation of project activities.

Undergraduates will be able to:

– to organize the project work of students in a digital environment, using tools for the implementation of team collaboration;

– plan independent work on project activities and exercise self-control during the implementation of the plan using methods of organizing extracurricular and extracurricular activities related to the research and project work of students

Learning Outcomes in EP (LOP):

LOP 5 – develops the structure and content of academic disciplines, using knowledge of mathematics and methods of teaching mathematics, forms and methods of control and control and measuring materials that ensure the quality of the educational process.

LOP 6 – develops educational resources, designs and implements offline and online learning through the organization of individual or team work using digital technologies.

LOP 8 – forms students' stable motivation to study mathematics throughout their lives using a personality–oriented approach.

Learning Outcomes in Course (LOC):

LOC 1 – has knowledge about the organization of cognitive, educational, research and project activities of students;

LOC 2 – uses methods of teaching students to independently search for methods of solving practical problems, the use of various methods of cognition;

LOC 3 – can organize classroom and extracurricular work of students related to research and project activities in mathematics.

Post requisites: DTE 602/1 Development of elective courses in mathematics.

Optional component 5

Course: **MPM 504/1 Modern tools and technologies for evaluating learning outcomes**

Intensity of the Course: 5 academic credits

Module Code: MPM-2

Module Name: Mathematics and problems of teaching mathematics

Prerequisites: Methods of teaching mathematics in basic school, Criteria Assessment Technology

Purpose and short description: The purpose of the discipline is the formation of skills for assessing the educational achievements of schoolchildren using modern means of evaluating learning outcomes.

Undergraduates will be able to:

– possess knowledge about the structure and content of control and measuring materials for various contexts;

– select control tasks to test the knowledge and skills of schoolchildren and monitor the level of learning of students;

– to evaluate the knowledge and skills of schoolchildren and analyze the data obtained.

Learning Outcomes in EP (LOP):

LOP 5 – develops the structure and content of academic disciplines, using knowledge of mathematics and methods of teaching mathematics, forms and methods of control and control and measuring materials that ensure the quality of the educational process.

LOP 7 – evaluates students' academic achievements and determines ways to improve them based on the results of scientific research of the educational process and using various means and technologies for evaluating learning outcomes.

Learning Outcomes in Course (LOC):

LOC 1 – knows the assessment policy within the competency-based approach;

LOC 2 – knows how to apply assessment principles;

LOC 3 – develops descriptors, criteria, assessment forms from the position of constructive coordination.

Post requisites: DTE 602/1 Development of elective courses in mathematics

Optional component 6

Course: **MPM 504/2 Methods of teaching mathematical analysis at school and university**

Intensity of the Course: 5 academic credits

Module Code: MPM - 2

Module Name: Mathematics and problems of teaching mathematics

Prerequisites: Mathematical Analysis 1-3, Methods of teaching mathematics in basic school

Purpose and short description: The purpose of the discipline is to develop the skills of undergraduates to identify and solve problems in teaching mathematical analysis at school and university.

Undergraduates will be able to:

– possess theoretical and practical knowledge about the problems of teaching mathematical analysis at school and university;

– analyze and systematize the current state of teaching mathematical analysis in specific educational institutions;

– to find optimal solutions to problems related to teaching mathematical analysis using various innovative technologies.

Learning Outcomes in EP (LOP):

LOP 5 – develops the structure and content of academic disciplines, using knowledge of mathematics and methods of teaching mathematics, forms and methods of control and control and measuring materials that ensure the quality of the educational process.

LOP 6 – develops educational resources, designs and implements offline and online learning through the organization of individual or team work using digital technologies.

LOP 7 – evaluates students' academic achievements and determines ways to improve them based on the results of scientific research of the educational process and using various means and technologies for evaluating learning outcomes.

Learning Outcomes in Course (LOC):

LOC 1 – knows the methods of teaching the course of mathematical analysis in secondary school and high school;

LOC 2 – organizes training in the course of mathematical analysis using student-centered and differentiated approaches;

LOC 3 – develops educational materials for teaching the course of mathematical analysis using digital technologies.

Post requisites: special courses.

2 OPTIONAL COMPONENTS OF THE CYCLE OF MAJOR COURSES

Optional component 1 ПД

Course: **MPM 603/1 Contemporary issues of teaching geometry**

Intensity of the Course: 6 academic credits

Module Code: MPM-2

Module Name: Mathematics and problems of teaching mathematics

Prerequisites: Methods of teaching mathematics in basic school, Methods of teaching Geometry

Purpose and short description: The purpose of the discipline is to develop undergraduates' skills to identify and solve problems in teaching geometry at school and university.

Undergraduates will be able to:

– possess theoretical and practical knowledge about the problems of teaching geometry at school and university;

– analyze and systematize the current state of geometry teaching in specific educational institutions;

– to find optimal solutions to problems related to learning geometry using various innovative technologies.

Learning Outcomes in EP (LOP):

LOP 3 – performs research activities using modern scientific methods and programs for statistical processing of research results.

LOP 7 – evaluates students' academic achievements and determines ways to improve them based on the results of scientific research of the educational process and using various means and technologies for evaluating learning outcomes.

LOP 8 – forms students' stable motivation to study mathematics throughout their lives using a personality–oriented approach.

Learning Outcomes in Course (LOC):

LOC 1 – has theoretical and practical knowledge about the problems of teaching geometry at school and university;

LOC 2 – analyzes and systematizes the current state of geometry education in specific educational institutions;

LOC 3 – finds optimal solutions to problems related to learning geometry using various innovative technologies.

Post requisites: special courses.

Optional component 2 ПД

Course: **MPM 603/2 Methods of teaching probability theory and mathematical statistics**

Intensity of the Course: 6 academic credits

Module Code: MPM-2

Module Name: Mathematics and problems of teaching mathematics

Prerequisites: Methods of teaching mathematics in basic school, Probability theory and mathematical statistics

Purpose and short description: The purpose of the discipline is the development of teaching skills and the organization of teaching students elements of probability theory and mathematical statistics.

Undergraduates will be able to:

– to identify the difficulties of students in mastering the elements of probability theory and mathematical statistics;

– to select and compose tasks of different levels of complexity, taking into account the age and individual characteristics of schoolchildren;

– conduct lessons using student-oriented teaching methods

Learning Outcomes in EP (LOP):

LOP 5 – develops the structure and content of academic disciplines, using knowledge of mathematics and methods of teaching mathematics, forms and methods of control and control and measuring materials that ensure the quality of the educational process.

LOP 6 – develops educational resources, designs and implements offline and online learning through the organization of individual or team work using digital technologies.

LOP 7 – evaluates students' academic achievements and determines ways to improve them based on the results of scientific research of the educational process and using various means and technologies for evaluating learning outcomes.

Learning Outcomes in Course (LOC):

LOC 1 – knows the basic concepts of probability theory; (axiomatics of probability theory, methods and basic methods for determining the probabilities of random events and complex events, description of one-dimensional and multidimensional random variables, limit theorems of probability theory)

LOC 2 – owns methods for calculating the probabilities of random variables, numerical characteristics, solving problems of mathematical statistics.

LOC 3 – owns the methods of compiling a system of training tasks and training sessions in stereometry

Post requisites: special courses.

Optional component 3 ПД

Course: **MPM 505/1 Foundations of geometry**
Intensity of the Course: 5 academic credits
Module Code: MPM-2
Module Name: Mathematics and problems of teaching mathematics
Prerequisites: Linear algebra and analytic geometry, Methods for solving construction problems
Purpose and short description: The purpose of the discipline is the formation of analysis, comparison, generalization and application of various systems of axioms of geometry construction, basic constructions and technologies of modern geometry, skills of transition from axioms to the usual presentation of elementary geometry.
Undergraduates will be able to:
– analyze, compare different types of axiom systems of geometry construction;
– freely solve problems and prove mathematical propositions using appropriate means based on this axiom system.
Learning Outcomes in EP (LOP):
LOP 4 – is able to present the results of educational and research activities in written and oral form, publishing scientific papers in rating journals and making a report to the scientific community.
LOP 9 – analyzes information on the issue under consideration with the compilation of a mathematical model taking into account advanced experience of modern scientific achievements for system conclusions on the collected parameters.
Learning Outcomes in Course (LOC):
LOC 1 – has knowledge of basic structures and technologies of modern geometry related to the axiomatic construction of various geometries;
LOC 2 – capable of determining general forms and patterns of a particular subject area;
LOC 3 – knows how to strictly prove a statement, formulate a result, and see the consequences of the result obtained.
Post requisites: special courses.

Optional component 4 ПД

Course: **MPM 505/2 Theory of curves and surfaces**
Intensity of the Course: 5 academic credits
Module Code: MPM-2
Module Name: Mathematics and problems of teaching mathematics
Prerequisites: Linear algebra and analytic geometry, Methods for solving construction problems
Purpose and short description: The objectives of the discipline are: the formation of a mathematical culture of a graduate student in the field of the theory of curves and surfaces, training in the field of algebraic and set-theoretic analysis of geometric and topological objects, mastering the classical mathematical apparatus of differential geometry and topology for further use in applications.
Undergraduates will be able to:
– to use methods of differential geometry in solving applied problems related to the implementation of professional functions;
– apply the mathematical apparatus of differential geometry and topology, differential geometric methods for the study of geometric objects and set-theoretic methods for the study of topology objects.

Learning Outcomes in EP (LOP):

LOP 4 – is able to present the results of educational and research activities in written and oral form, publishing scientific papers in rating journals and making a report to the scientific community.

LOP 9 – analyzes information on the issue under consideration with the compilation of a mathematical model taking into account advanced experience of modern scientific achievements for system conclusions on the collected parameters.

Learning Outcomes in Course (LOC):

LOC 1 – uses knowledge of the theory of curves and surfaces to solve problems in the professional field and in independent research;

LOC 2 – solves problems on the theory of curves and surfaces with the preparation of a mathematical model based on the techniques and methods of differential geometry;

LOC 3 – defines methods for solving problems of a school course of mathematics using the instruments of differential geometry

Post requisites: special courses.

Optional component 5 ПД

Course: **DTE 501/1 Mathematical modeling of applied problems**

Intensity of the Course: 5 академических кредита

Module Code: DTE-3

Module Name: Digital technologies in mathematical education

Prerequisites: Mathematical Analysis 1-3, Differential equations

Purpose and short description: The purpose of the discipline is to ensure that undergraduates master the basic concepts and methods of mathematical modeling, improving the skills of solving and teaching methods for solving applied problems.

Undergraduates will be able to:

– analyze applied problems, the models of which are systems of equations, systems of inequalities and ordinary differential equations;

– develop mathematical models of the studied processes and phenomena;

– choose rational solution methods for the compiled mathematical model.

Learning Outcomes in EP (LOP):

LOP 4 – is able to present the results of educational and research activities in written and oral form, publishing scientific papers in rating journals and making a report to the scientific community.

LOP 9 – analyzes information on the issue under consideration with the compilation of a mathematical model taking into account advanced experience of modern scientific achievements for system conclusions on the collected parameters.

Learning Outcomes in Course (LOC):

LOC 1 – understands the role and influence of mathematical knowledge on the structure of the world;

LOC 2 – develops mathematical models of the processes and phenomena being studied using knowledge from various fields of mathematics;

LOC 3 – selects rational methods for solving problems for the constructed mathematical model, solves problems analytically and numerically using computer programs.

Post requisites: special courses.

Optional component 6 ПД

Course: **DTE 501/2 Using computer environments in teaching mathematics**
Intensity of the Course: 5 академических кредита
Module Code: DTE-3
Module Name: Digital technologies in mathematical education
Prerequisites: Information and Communication Technologies, Methods of teaching mathematics in basic school
Purpose and short description: The purpose of the discipline is to form the skills of teaching mathematics using a system of dynamic geometry and computer algebra systems.
Undergraduates will be able to:
– analyze, compare and choose the optimal packages of applied programs in the context of a mathematical discipline;
– know the ways and methods of using application packages in teaching mathematics;
– develop digital resources using application software packages.
Learning Outcomes in EP (LOP):
LOP 6 – develops educational resources, designs and implements offline and online learning through the organization of individual or team work using digital technologies.
LOP 7 – evaluates students' academic achievements and determines ways to improve them based on the results of scientific research of the educational process and using various means and technologies for evaluating learning outcomes.
LOP 8 – forms students' stable motivation to study mathematics throughout their lives using a personality–oriented approach.
Learning Outcomes in Course (LOC):
LOC 1 – analyzes and systematizes various sources on the use of digital technologies in teaching mathematics;
LOC 2 – creates practical, creative math assignments involving the use of computer tools;
LOC 3 – develops and conducts educational classes, extracurricular activities in mathematics using computer technology.
Post requisites: special courses.

Optional component 7 ПД

Course: **DTE 602/1 Development of elective courses in mathematics**
Intensity of the Course: 6 academic credits
Module Code: DTE-3
Module Name: Digital technologies in mathematical education
Prerequisites: Methods of teaching mathematics in basic school, Criteria Assessment Technology
Purpose and short description: The purpose of the discipline is to develop the skills to create an elective course based on methodological principles and approaches and taking into account the needs of the target audience.
Undergraduates will be able to:
– develop an elective course based on determining the purpose of the course and analyzing the needs of the target audience;
– work in a team and develop cooperation between classmates to achieve a common goal.
Learning Outcomes in EP (LOP):

LOP 5 – develops the structure and content of academic disciplines, using knowledge of mathematics and methods of teaching mathematics, forms and methods of control and control and measuring materials that ensure the quality of the educational process.

LOP 6 – develops educational resources, designs and implements offline and online learning through the organization of individual or team work using digital technologies.

LOP 7 – evaluates students' academic achievements and determines ways to improve them based on the results of scientific research of the educational process and using various means and technologies for evaluating learning outcomes.

Learning Outcomes in Course (LOC):

LOC 1 – develop an elective course based on the definition of the purpose of teaching the course and analysis of the needs of the target audience;

LOC 2 – optimize the content and structure of the course in accordance with the expected learning outcomes;

LOC 3 – create the elements, style and visual design of the course;

LOC 4 – develop digital learning materials to provide information, as well as monitoring and evaluating the educational achievements of students;

LOC 5 – work in a team and develop cooperation between classmates to achieve a common goal.

Post requisites: special courses.

Optional component 8 ПД

Course: **DTE 602/2 Development of digital educational resources in teaching mathematics at school**

Intensity of the Course: 6 academic credits

Module Code: DTE-3

Module Name: Digital technologies in mathematical education

Prerequisites: Information and Communication Technologies, Methods of teaching mathematics in basic school

Purpose and short description: The purpose of the discipline is to develop skills of working with digital tools for the development of a digital educational resource in mathematics for secondary schools.

Undergraduates will be able to:

– to choose and use the optimal application software for the creation of digital educational resources;

– develop digital educational resources in mathematics.

Learning Outcomes in EP (LOP):

LOP 5 – develops the structure and content of academic disciplines, using knowledge of mathematics and methods of teaching mathematics, forms and methods of control and control and measuring materials that ensure the quality of the educational process.

LOP 6 – develops educational resources, designs and implements offline and online learning through the organization of individual or team work using digital technologies.

LOP 7 – evaluates students' academic achievements and determines ways to improve them based on the results of scientific research of the educational process and using various means and technologies for evaluating learning outcomes.

Learning Outcomes in Course (LOC):

LOC 1 – understands the need for an in-depth study of digital technologies as a factor in increasing professional competence;

LOC 2 – critically evaluates existing domestic and foreign digital educational platforms and instruments;

LOC 3 – develops digital educational resources (presentations, video lectures, interactive practical tasks, etc.);

LOC 4 – creates surveys, questionnaires, tests, conduct feedback using cloud technologies.

Post requisites: special courses.

Optional component 9 ПД

Course: **TMS 501/1 Theoretical foundations of teaching mathematical problem solving**

Intensity of the Course: 5 academic credits

Module Code: TMS – 4

Module Name: Teaching methods for solving mathematical problems

Prerequisites: Methods of teaching mathematics in basic school, TMS 501/1 Theoretical foundations of teaching mathematical problem solving.

Purpose and short description: The purpose of the discipline is to form the skills of teaching schoolchildren to solve various types of mathematical problems using modern technologies.

Undergraduates will be able to:

– organize the training of schoolchildren in solving mathematical problems;

– develop level-based and non-standard mathematical problems for the development of mathematical abilities of schoolchildren.

Learning Outcomes in EP (LOP):

LOP 5 – develops the structure and content of academic disciplines, using knowledge of mathematics and methods of teaching mathematics, forms and methods of control and control and measuring materials that ensure the quality of the educational process.

LOP 6 – develops educational resources, designs and implements offline and online learning through the organization of individual or team work using digital technologies.

LOP 8 – forms students' stable motivation to study mathematics throughout their lives using a personality–oriented approach.

Learning Outcomes in Course (LOC):

LOC 1 – knows and uses the procedural component of teaching students to solve mathematical problems;

LOC 2 – analyzes and evaluates modern technologies from the point of view of use for teaching solving mathematical problems;

LOC 3 – develops its own methodology for teaching students to solve specific types of mathematical problems.

Постреквизиты: TMS 501/2 Methodology for teaching to prove of mathematical sentences, TMS 602/1 Methods of solving solid geometry problems, TMS 602/2 Non-standard methods for solving mathematical problems.

Optional component 10 ПД

Course: **TMS 501/2 Methodology for teaching to prove of mathematical sentences**

Intensity of the Course: 5 academic credits

Module Code: TMS - 4

Module Name: Teaching methods for solving mathematical problems, Elementary mathematics.

Prerequisites: Methods of teaching mathematics in basic school, Methods of teaching Geometry

Purpose and short description: The purpose of the discipline is the formation of skills for conducting propaedeutic work of teaching schoolchildren to prove mathematical sentences.

Undergraduates will be able to:

– explain the development of reasoning at different levels of education (elementary school, middle school, high school, university);

– train students to prove mathematical propositions using various methods of proving judgments, both general and particular;

– create a plan-summary of a problem lesson or seminar for students to independently discover mathematical facts.

Learning Outcomes in EP (LOP):

LOP 5 – develops the structure and content of academic disciplines, using knowledge of mathematics and methods of teaching mathematics, forms and methods of control and control and measuring materials that ensure the quality of the educational process.

LOP 6 – develops educational resources, designs and implements offline and online learning through the organization of individual or team work using digital technologies.

LOP 7 – evaluates students' academic achievements and determines ways to improve them based on the results of scientific research of the educational process and using various means and technologies for evaluating learning outcomes.

Learning Outcomes in Course (LOC):

LOC 1 – proves mathematical propositions using theoretical knowledge and practical problem-solving skills;

LOC 2 – implements methods of teaching schoolchildren to prove mathematical statements using visualization methods with the help of modern educational technologies and tools;

LOC 3 – creates an outline of a problematic lesson for students to independently discover mathematical facts;

LOC 4 – groups, systematizes and, using various design methods, compiles a portfolio of independently created teaching materials for teaching, critically assessing the results of their teaching.

Post requisites: special courses

Optional component 11

Course: **TMS 602/1 Methods of solving solid geometry problems**

Intensity of the Course: 5 academic credits

Module Code: TMS – 4

Module Name: Teaching methods for solving mathematical problems

Prerequisites: Methods of teaching mathematics in basic school, TMS 501/1 Theoretical foundations of teaching mathematical problem solving.

Purpose and short description The purpose of the discipline is the formation of skills for conducting propaedeutic work of teaching schoolchildren to solve stereometric problems.

Undergraduates will be able to:

– teach to see different problem solving strategies using inductive and deductive approaches to thinking;

– teach to find information necessary for solving mathematical problems from various sources, present it in an understandable form and make decisions in conditions of incomplete and redundant, accurate and probabilistic information;

– develop differentiated stereometric tasks taking into account the individual and age characteristics of schoolchildren.

Learning Outcomes in EP (LOP):

LOP 6 – develops educational resources, designs and implements offline and online learning through the organization of individual or team work using digital technologies.

LOP 7 – evaluates students' academic achievements and determines ways to improve them based on the results of scientific research of the educational process and using various means and technologies for evaluating learning outcomes.

LOP 8 – forms students' stable motivation to study mathematics throughout their lives using a personality–oriented approach.

Learning Outcomes in Course (LOC):

LOC 1 – design method as a generalized method of activity for constructing objects (geometric figures and configurations, methods for solving problems, knowledge systems on the topics of the stereometry course);

LOC 2 – applies a structural method for solving geometric problems (reconstruction, rearrangement of supporting geometric structures);

LOC 3 – owns the methods of compiling a system of training tasks and training sessions in stereometry.

Post requisites: special cources

Optional component 12

Course: **TMS 602/2 Non-standard methods for solving mathematical problems**

Intensity of the Course: 5 academic credits

Module Code: TMS - 4

Module Name: Teaching methods for solving mathematical problems

Prerequisites: Methods of teaching mathematics in basic school, TMS 501/1 Theoretical foundations of teaching mathematical problem solving.

Purpose and short description: The purpose of the discipline is to develop skills in developing mathematical content and flexible curricula, as well as the ability to use various methods of solving problems that are not provided for in approved school textbooks on mathematics aimed at personal development and individual improvement of school students.

Undergraduates will be able to:

– create a creative and flexible math curriculum;

– organize the preparation of schoolchildren for participation in competitions and olympiads;

– to use methods and techniques of motivation to study mathematics for the personal development of the student.

Learning Outcomes in EP (LOP):

LOP 6 – develops educational resources, designs and implements offline and online learning through the organization of individual or team work using digital technologies.

LOP 7 – evaluates students' academic achievements and determines ways to improve them based on the results of scientific research of the educational process and using various means and technologies for evaluating learning outcomes.

LOP 8 – forms students' stable motivation to study mathematics throughout their lives using a personality–oriented approach.

Learning Outcomes in Course (LOC):

LOC 1 – understands the importance of using a creative, creative approach when solving mathematical problems;

LOC 2 – uses various methods to form a positive attitude towards mathematics and solving mathematical problems in schoolchildren throughout their lives;

LOC 3 – develop and compiling a system of educational tasks that require a non-standard approach to solve them.

Post requisites: special courses.