

General Information	Name, code and number of credits	MATH223, Teaching methods of Mathematics, 6 ECTS
	Department	Mathematics
	Program	Undergraduate
	Term	Spring 2026
	Instructor	Aida Asgarova
	E-mail:	aidaasgarova@gmail.com
	Phone:	-
	Classroom/hours	Narimanov building
Prerequisites	EDU101 Introduction to Education	
Language of instruction	English	
Type of subject	Required	
Required textbooks and course materials	<p><i>Core Textbooks:</i></p> <ol style="list-style-type: none"> 1. John A. Van de Walle, Karen S. Karp, and Jennifer M. Bay-Williams, (2012) “<i>Elementary and Middle School Mathematics: Teaching Developmentally</i>” 2. Michael Haese, Mark Humphries, Chris Sangwin, Ngos Vo, (2010) “<i>Mathematics for the international student Mathematical Studies SL</i>” 3. Juliana Tapper, (2025) “<i>Teaching 6-12 Math Intervention: A Practical Framework To Engage Students Who Struggle</i>” 4. Linda Dacey, Karen Gartland, Jayne Bamford Lynch, (2025) “<i>Well Played: Building Mathematical Thinking Through Number Games and Puzzles, Grades 3–5</i>” 5. Ann McCoy, Joann Barnett, and Emily Combs, (2024) “<i>High-Yield Routines, 2nd Edition, Grades K-8</i>” 	
Course description	<p>Topics include an overview of the course and expectations; historical perspectives on mathematics education; and current trends and challenges in elementary mathematics teaching. The course covers teaching geometric concepts, measurement instruction, cognitive development theories, and stages of mathematical understanding in children. It addresses curriculum development and alignment with national and state standards, instructional approaches such as direct instruction and inquiry-based learning, and the integration of educational technologies and digital tools. The course also focuses on formative and summative assessment, classroom management, problem-solving strategies, and critical thinking in mathematics. Additionally, it examines diverse learning needs, inclusive teaching practices, the use of manipulatives, algebraic thinking, data collection and interpretation, probability concepts, and reflective practices for continuous professional growth.</p>	

Course objectives	<ul style="list-style-type: none"> • To provide students with a comprehensive understanding of the historical development, current trends, and challenges in mathematics education. • To develop knowledge of cognitive development theories and stages of mathematical understanding in children. • To equip students with the ability to design and align mathematics curricula with national and state standards. • To introduce and apply effective instructional strategies, including direct instruction, inquiry-based learning, and problem-solving approaches. • To develop competence in teaching key mathematical concepts such as geometry, measurement, algebraic thinking, data analysis, and probability at the elementary level. • To enhance students' ability to integrate educational technologies and digital tools into mathematics instruction. • To prepare students to design and implement formative and summative assessment strategies in mathematics. • To develop classroom management skills and strategies for establishing positive and productive learning environments. • To promote inclusive teaching practices, including adapting instruction to diverse learners and addressing the needs of students with disabilities. • To encourage the effective use of manipulatives to support conceptual understanding in mathematics. • To foster reflective practice and continuous professional development in mathematics teaching. 	
Learning outcomes	<p>By the end of the course, students will be able to:</p> <ul style="list-style-type: none"> • Explain and analyze stages of mathematical development in children based on cognitive learning theories. • Design mathematics lesson plans aligned with curriculum standards and appropriate learning objectives. • Apply a variety of instructional strategies, including direct instruction and inquiry-based approaches, in mathematics teaching. • Integrate appropriate educational technologies and digital tools to enhance mathematical understanding. • Demonstrate effective classroom management techniques that promote a positive and productive learning environment. • Develop and implement problem-solving strategies that encourage critical thinking and reasoning in mathematics. 	
Teaching methods	Group discussion	x
	Experiential exercise	x

	Course paper	x	
Evaluation	Methods	Date/deadlines	Percentage (%)
	Midterm exam	April	30
	Class Participation	Every class	5
	Quizzes	Through semester	20 (4 quizzes)
	Activity	Every class	5
	Final exam	June	40
	Total		100
Policy	<p>Preparation for class The structure of this course makes your individual study and preparation outside the class extremely important. The lecture material will focus on the major points introduced in the text. Reading the assigned chapters and having some familiarity with them before class will greatly assist your understanding of the lecture. After the lecture, you should study your notes and work relevant problems and cases from the end of the chapter and sample exam questions.</p> <p>Throughout the semester we will also have a large number of review sessions. These review sessions will take place during the regularly scheduled class periods.</p> <p>Quizzes and examinations Quizzes may be given unannounced throughout the term. There will be no make-up quizzes, no make-up exams. If students miss an exam, a zero score will be assigned to the missed exam.</p> <p>Withdrawal (pass/fail) This course strictly follows grading policy of the School of Engineering and Applied Science. Thus, a student is expected to achieve a mark of at least 60% to pass. In case of failure, he/she will be required to repeat the course the following term or year.</p> <p>Cheating/plagiarism Cheating or other plagiarism during the Quizzes, Mid-term and Final Examinations will lead to paper cancellation. In this case, the student will automatically get zero (0), without any considerations.</p> <p>Professional behavior guidelines The students shall behave in the way to create favorable academic and professional environment during the class hours. Unauthorized discussions and unethical behavior are strictly prohibited.</p> <p>Ethics Use of any electronic devices is prohibited in the classroom. All devices should be turned off before entering class. This is a</p>		

		university policy and violators will be reprimanded accordingly! Students should not arrive in late to class!	
Tentative Schedule			
Week	Date/Day (tentative)	Topics	Textbook/ Assignments
1		<ul style="list-style-type: none"> • Introduction to Mathematics Education. • Number Properties. 	<p>[1] 23-36</p> <p>[2] 19-33</p>
2		<ul style="list-style-type: none"> • Geometry and Measurement Instruction • Measurement. 	<p>[1] 500-507</p> <p>[2] 37-45</p>
3		<ul style="list-style-type: none"> • Understanding Mathematical Development in Children. • Laws of algebra. 	<p>[1] 104-114</p> <p>[2] 73-87</p>
4		<ul style="list-style-type: none"> • Curriculum Design and Planning. • Equations and Formulae. 	<p>Quiz (5 pts)</p> <p>[1] 55-66</p> <p>[2] 91-101</p>
5		<ul style="list-style-type: none"> • Instructional Strategies for Mathematics. • Linear simultaneous equation. 	<p>[1] 69-74</p> <p>[2] 108-121</p>
6		<ul style="list-style-type: none"> • Integrating Technology in Mathematics Teaching. • Sets and Venn diagrams. 	<p>[1] 239-246</p> <p>[2] 211-225</p>
7		<ul style="list-style-type: none"> • Assessment and Evaluation in Mathematics • Pythagoras' theorem. 	<p>[1]83-96</p> <p>[2] 349-362</p>
TBA		Midterm exam	
8		<ul style="list-style-type: none"> • Classroom Management Techniques. • Coordinate geometry. 	<p>Quiz (5 pts)</p> <p>[1] 507-518</p> <p>[2] 375-394</p>
9		<ul style="list-style-type: none"> • Problem-Solving Strategies. 	<p>[1] 81-110</p>
10		<ul style="list-style-type: none"> • Differentiated Instruction in Mathematics. • Perimeter and area. 	<p>[1] 460-474</p> <p>[2] 411-424</p>
11		<p>Novruz Holiday</p> <ul style="list-style-type: none"> • Teaching Mathematical Concepts through Manipulatives. • Volume. 	<p>Quiz (5 pts)</p> <p>[1] 484-490</p> <p>[2] 428-438</p>
12		<ul style="list-style-type: none"> • Teaching Algebraic Thinking . • Sequence and Series. 	<p>[1] 121-124</p> <p>[2] 127- 140</p>
13		<ul style="list-style-type: none"> • Data Analysis and Probability . • Descriptive statistics. 	<p>[1] 552-568</p> <p>[2] 157-167</p>

14		<ul style="list-style-type: none"> • Inclusive Mathematics Education • Logic. 	<p>[1] 568-577</p> <p>[2] 231- 240</p>
15		<ul style="list-style-type: none"> • Professional Development and Reflective Practice . • Probability. 	<p>Quiz (5 pts)</p> <p>[1] 581-601</p> <p>[2] 257-272</p>
TBA		Final Exam	