



	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods	Course Learning Outcomes
1.Week	*Explains the fundamental concepts related to learning and teaching mathematics.			*Before starting this week, students are expected to have a theoretical foundation regarding the nature of mathematical thinking, the meaning of learning and teaching mathematics, and the interconnections between these processes. In this context, students should reflect on the definition, key characteristics, and educational significance of mathematical thinking, and understand that mathematics teaching is not merely a process of knowledge transfer but also a way of fostering thinking patterns. It is also important that they develop an awareness of how the aims of mathematics education have evolved historically and how these goals are transformed into today's pedagogical practices. To build this conceptual background, it is highly recommended that students carefully read Chapter 1: The nature of mathematical thinking, learning, and teaching from the main course textbook: Ünlü, M. (Ed.) (2020). New approaches in mathematics teaching with practice-based examples. Ankara: Pegem Akademi Publishing.	*During this week, instruction will be guided by concept-based discussions, with a focus on fostering students' awareness of what constitutes mathematical thinking. To achieve this, a combination of direct instruction and interactive strategies such as group discussions, brainstorming activities, and the creation of concept maps will be utilized within a constructivist approach. Students will be encouraged to connect the key concepts of learning and teaching mathematics to their own experiences, enabling them to make sense of new knowledge through prior understanding. In addition, brief video clips from real classroom settings will be analyzed in group discussions to explore how theoretical knowledge is reflected in actual teaching practices.	Ö.Ç.1 Ö.Ç.1 Ö.Ç.1
2.Week	*The meaning of learning and teaching mathematics			*Before engaging with this week's content, students are expected to develop a foundational understanding of what it means to learn and teach mathematics. In this regard, reflecting on the differences between teacher-centered and student-centered approaches, the impact of learning environments on mathematics instruction, and the cognitive and affective influences of mathematics on individuals is crucial. It should be recognized that teaching mathematics goes beyond the transmission of knowledge—it also involves fostering skills such as meaningful learning, problem solving, communication, and making connections. Accordingly, students are recommended to read Chapter 2: Learning and Teaching Mathematics from the course textbook: Ünlü, M. (Ed.) (2020). New Approaches in Mathematics Teaching with Practice-Based Examples.	*This week, instructional activities will be grounded in constructivist teaching methods to help students build a conceptual framework about the meaning of learning and teaching mathematics. Students will be encouraged to explore new ideas through their prior experiences, and the learning process will be designed to promote active engagement. The classroom environment will be shaped through interactive presentations, small group discussions, think-write-share tasks, and in-class case study analyses, all aiming to foster reflective and inquiry-based thinking. Additionally, short video materials and teacher observation forms will be used to develop students' ability to evaluate instructional practices.	Ö.Ç.1 Ö.Ç.2 Ö.Ç.1 Ö.Ç.2 Ö.Ç.1 Ö.Ç.2

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3.Week	*The aims and fundamental principles of mathematics teaching			*This week will cover the aims of mathematics teaching and the fundamental principles that shape the instructional process. As preparation for the lesson, students are expected to reflect on the role of mathematics instruction in developing individuals' analytical thinking, problem-solving skills, and the ability to relate mathematics to real-life situations. It is also important to have prior knowledge of instructional principles such as clarity, structure, continuity, integration, and meaningfulness. Accordingly, students are advised to read Chapter 3: Foundations and Development of Mathematics Teaching from the course textbook: Ünlü, M. (Ed.) (2020). New Approaches in Mathematics Teaching with Practice-Based Examples.	*This week, multiple instructional strategies will be employed to help students understand both the theoretical and practical dimensions of the aims and principles of mathematics teaching. Student-centered approaches will be emphasized, including group work, discussion-based learning, case study analysis, and the use of concept maps to help students explore the relationships among instructional principles. In addition, the historical development of mathematics instruction will be visually supported through short video presentations and timelines, enabling students to connect historical context with contemporary principles. By the end of the lesson, students will be able to relate key principles of effective mathematics teaching to their own instructional approaches.	Ö.Ç.2 Ö.Ç.3 Ö.Ç.2 Ö.Ç.3 Ö.Ç.2 Ö.Ç.3
4.Week	*Fundamental skills in mathematics teaching			*This week focuses on the fundamental skills to be developed through mathematics teaching. Students are expected to be familiar with the significance of skills such as communication, problem solving, reasoning, representation, and making connections within the instructional process. Reflecting on how to structure and foster these skills in students will enhance the effectiveness of in-class activities. In this regard, it is recommended that students read Chapter 4: Skills Developed Through Effective Mathematics Teaching from the course textbook: Ünlü, M. (Ed.) (2020). New Approaches in Mathematics Teaching with Practice-Based Examples prior to the session.	*This week aims to help students identify the essential skills that need to be developed in mathematics teaching and understand how to integrate these skills into the instructional process. Accordingly, various instructional methods and techniques will be used, including interactive group work, analysis of sample teaching activities, role-playing, discussions, and individual reflections, all based on a constructivist approach. Case analyses will particularly focus on how to foster skills such as communication, problem solving, reasoning, and representation in students. These skills will be explored through practical discussions on how to incorporate them into instructional planning.	Ö.Ç.2 Ö.Ç.3 Ö.Ç.4 Ö.Ç.2 Ö.Ç.3 Ö.Ç.4 Ö.Ç.2 Ö.Ç.3 Ö.Ç.4
5.Week	*Current trends and issues in mathematics teaching			*This week focuses on current trends and challenges in mathematics teaching within the context of the skills developed through effective instruction. Participants are expected to be familiar with key ideas such as student-centered learning models, integration of technological tools, teaching approaches that address individual differences, and the importance of interdisciplinary instruction. Additionally, it is important that they analyze common challenges such as learning loss, lack of motivation, and pedagogical obstacles in instructional processes. In this regard, it is recommended to read Chapter 4: Skills Developed Through Effective Mathematics Teaching from the course textbook: Ünlü, M. (Ed.) (2020). New Approaches in Mathematics Teaching with Practice-Based Examples prior to class.	*During this week, interactive instructional methods will be employed to enable students to analyze current trends and major challenges in teaching mathematics. Discussion-based sessions, case studies, brainstorming activities, and presentations supported by digital content will be used to foster students' analytical and reflective thinking skills. Students will be expected to develop example applications involving technological tools and propose instructional redesigns based on current research. Additionally, they will be encouraged to generate solution strategies by examining real-life classroom problem scenarios.	Ö.Ç.3 Ö.Ç.4 Ö.Ç.3 Ö.Ç.4 Ö.Ç.3 Ö.Ç.4

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6.Week	*Reflections of learning and instructional approaches on mathematics teaching			*This week, the focus will be on the Lesson Study model, which is widely recognized as an effective approach to professional development in mathematics education. Students are expected to be familiar with the main stages of the model (planning, implementation, observation, and reflection) and examine its process through examples. The importance of collaborative instructional design and continuous feedback for teacher development will also be emphasized. As preparation, it is recommended to read Chapter 6: The Lesson Study Approach in Professional Development from the book Ünlü, M. (Ed.) (2020). New Approaches in Mathematics Teaching with Practice-Based Examples.	*During this week, interactive teaching methods will be employed to help students understand the Lesson Study model both theoretically and practically. The session will begin with an overview of the historical development and theoretical foundations of the model. Students will then engage in group activities to collaboratively design and evaluate sample lesson plans. Through case analyses, successful implementations of Lesson Study will be examined, and participants will be asked to develop a small-scale Lesson Study draft tailored to their own subject area. The instructor will facilitate the process by providing guidance and constructive feedback throughout the session.	Ö.Ç.2 Ö.Ç.4 Ö.Ç.2 Ö.Ç.4 Ö.Ç.2 Ö.Ç.4
7.Week	*Using appropriate methods and environments in mathematics teaching			*This week will focus on the effective use of multiple representations (symbolic, visual, concrete, and verbal) in mathematics instruction and the application of the constructivist approach in classroom practices. Students are expected to have a basic understanding of how different types of representations support conceptual understanding in mathematics, as well as familiarity with the core principles of constructivist teaching. Emphasis will be placed on how active student engagement and the ability to shift between representations enhance mathematical learning. As preparation, it is recommended to read Chapter 5: The Use of Multiple Representations in Mathematics Teaching and Chapter 6: The Constructivist Approach in Mathematics Education from Ünlü, M. (Ed.) (2020). New Approaches in Mathematics Teaching with Practice-Based Examples.	*This week will incorporate student-centered and interactive teaching methods based on the constructivist approach. Emphasis will be placed on group work, classroom discussions, activities that promote transitions between different representations, and problem-based learning. Students will be encouraged to explain mathematical concepts using symbolic, visual, verbal, and concrete representations and to make meaningful connections among them. In addition, technology-supported applications such as digital tools and dynamic geometry software will be utilized to highlight the role of multiple representations in enhancing conceptual understanding.	Ö.Ç.3 Ö.Ç.4 Ö.Ç.3 Ö.Ç.4 Ö.Ç.3 Ö.Ç.4
8.Week	*Midterm exam week			*Midterm exam week	*Midterm exam week	
9.Week	*Components of effective mathematics instruction			*This week will focus on the role of learning trajectories in mathematics education and their impact on the instructional process. Students are expected to have a basic understanding of how learning trajectories can be used to identify cognitive difficulties and structure conceptual transitions. Topics will include identifying prior knowledge, designing step-by-step instructional sequences to reach target concepts, and analyzing student thinking. As preparation, it is recommended to read Chapter 8: Learning Trajectories from Ünlü, M. (Ed.) (2020). New Approaches in Mathematics Teaching with Practice-Based Examples.	*This week, the creation and effective classroom use of learning trajectories in mathematics instruction will be explored through interactive methods. The instructional process will incorporate strategies such as group discussions, concept mapping, case analysis, and examination of student responses. Sample problems will be used to model various learning paths, encouraging pre-service teachers to design their own instructional approaches. Visual materials, digital tools, and instructional videos will also be utilized to enrich the learning experience through multiple representations.	Ö.Ç.3 Ö.Ç.4 Ö.Ç.5 Ö.Ç.3 Ö.Ç.4 Ö.Ç.5 Ö.Ç.3 Ö.Ç.4 Ö.Ç.5

	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods	Course Learning Outcomes
10.Week	*A sociocultural and economic perspective on mathematics teaching			*This week will focus on how mathematics teaching is shaped not only cognitively but also through social, cultural, and economic contexts. Before the lesson, students are expected to develop a foundational awareness of the role of mathematical knowledge in society, the impact of cultural diversity on instruction, and how economic conditions affect equity in education. Special attention should be given to the influence of factors such as disadvantaged groups, language, and cultural differences on mathematics teaching. In this context, it is important to read the relevant chapter titles of the book Ünlü, M. (Ed.) (2020). New Approaches in Teaching Mathematics with Application Examples.	*This week, awareness-raising and discussion-based instructional methods will be employed to explore mathematics teaching from social, cultural, and economic perspectives. The lesson will include case studies, group discussions, short documentaries, video screenings, and student-centered inquiry activities. Students will be expected to design instructional practices tailored to learners from diverse socio-cultural backgrounds and discuss their plans within the classroom setting. Through these methods, critical dimensions of mathematics education such as social justice, equity, and cultural inclusivity will be emphasized.	Ö.Ç.4 Ö.Ç.5 Ö.Ç.4 Ö.Ç.5 Ö.Ç.4 Ö.Ç.5
11.Week	*In-class instructional examples related to the learning domain of numbers and operations			*This week will focus on the planning and implementation of classroom practices in the “Numbers and Operations” learning domain through contemporary instructional approaches. Students are expected to be familiar with the theoretical foundations of the following teaching models and to develop ideas on how they can be applied in classroom settings: Realistic Mathematics Education, Technology-Supported Mathematics Instruction, Flipped Learning in Mathematics Education, Problem-Based Mathematics Education, Cooperative Learning in Mathematics, STEM and Its Applications, Arts-Based Mathematics Education, Creative Drama in Mathematics Instruction, and Project-Based Mathematics Instruction. In this regard, it is recommended to review the relevant sections of the course textbook Ünlü, M. (Ed.) (2020). New Approaches in Mathematics Teaching with Practice-Based Examples prior to class.	*This week, instructional practices for the “Numbers and Operations” learning domain will be structured using various contemporary approaches. Students will work in groups to examine Realistic Mathematics Education, Technology-Supported Mathematics Instruction, Flipped Learning, Problem-Based Learning, Cooperative Learning, STEM, Arts-Based Teaching, Creative Drama, and Project-Based Learning. Based on these approaches, they will design original activities and implement them through classroom simulations. The instructional process will be supported through discussions, collaborative work, use of digital content, and hands-on presentations. This method aims to enhance students' theoretical understanding and practical teaching competencies.	Ö.Ç.5 Ö.Ç.5 Ö.Ç.5

	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods	Course Learning Outcomes
12.Week	*In-class instructional examples related to the learning domain of algebra			*Before starting this week, learners are expected to be familiar with the fundamental concepts of the algebra learning domain, such as variables, algebraic expressions, equations, and inequalities, as well as instructional approaches that support effective algebra teaching. In particular, it is recommended that students review the core principles and classroom integration strategies of the following teaching methods: Realistic Mathematics Education, Technology-Supported Instruction, Flipped Learning, Problem-Based Learning, Cooperative Learning, STEM, Art-Based Teaching, Creative Drama, and Project-Based Learning. In this context, reviewing the relevant chapters of Ünlü, M. (Ed.) (2020). New Approaches in Mathematics Teaching with Practice Examples. Ankara: Pegem Akademi Publishing will provide a solid foundation for the classroom applications planned for this week.	*This week's sessions will focus on applying innovative methods and strategies to teach key concepts within the algebra learning domain through practical in-class activities. Realistic Mathematics Education will guide students to engage with algebraic problems contextualized in real-life scenarios. Under the Technology-Supported Mathematics Instruction model, digital tools (e.g., GeoGebra, virtual algebra platforms) will be used to visualize abstract concepts. The Flipped Learning model will be utilized by providing video-based pre-class content, reserving in-class time for discussion and problem-solving activities. Through Problem-Based Learning, learners will explore real-world algebraic problem scenarios. In addition, students will be encouraged to discover algebraic concepts through Cooperative Learning, STEM, Art-Based Instruction, Creative Drama, and Project-Based Learning approaches. Activities will include group work, learning stations, interactive whiteboard exercises, role-playing, scenario development, and presentations to foster engagement and deeper understanding.	Ö.Ç.5 Ö.Ç.5 Ö.Ç.5
13.Week	*In-class instructional practices for the learning domain of geometry and measurement			*Before starting this week, it is expected that pre-service teachers have a solid understanding of the basic concepts of the geometry and measurement learning domain. It is particularly important to be familiar with pedagogical approaches related to spatial reasoning, analyzing shape properties, understanding units, and using measurement tools. Classroom practices will be examined within the framework of Realistic Mathematics Education, Technology-Enhanced Mathematics Instruction, Flipped Learning, Problem-Based Learning, Cooperative Learning, STEM, Art-Based Instruction, Creative Drama, and Project-Based Learning. It is recommended to review the relevant sections of the primary course material: Ünlü, M. (Ed.) (2020). Uygulama örnekleriyle matematik öğretiminde yeni yaklaşımlar prior to the lesson.	*This week's instruction will encompass a variety of methods for teaching geometry and measurement in the classroom. The focus will be on supporting students' learning through discovery, discussion, and modeling within a constructivist framework. Real-world contexts will be integrated using Realistic Mathematics Education, technology-enhanced instruction (e.g., dynamic geometry software), flipped learning, and problem-based learning to foster active student engagement. Cooperative learning groups will be utilized to encourage peer interaction and shared perspectives. Additionally, interdisciplinary practices such as STEM, creative drama, art-based instruction, and project-based learning will be implemented to support visual, auditory, and kinesthetic learning modalities. Through these varied strategies, the goal is to enable students to develop a deep and conceptual understanding of geometry and measurement in both individual and collaborative learning environments.	Ö.Ç.5 Ö.Ç.5 Ö.Ç.5

	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods	Course Learning Outcomes
14.Week	*In-class instructional practices related to the data handling learning domain.			*Before starting this week, it is expected that participants understand the scope and key concepts of the data handling learning domain, including data collection, organization, analysis, and interpretation, as well as the associated instructional objectives. Learners should also be aware of effective ways to present data in classroom settings and how to foster students’ skills in reading charts, making comparisons, and drawing conclusions. Within this framework, it is recommended to conduct preliminary readings on how instructional approaches such as Realistic Mathematics Education, Technology-Supported Instruction, Flipped Learning, Problem-Based Learning, Collaborative Learning, STEM, Arts-Based Instruction, Creative Drama, and Project-Based Learning can be integrated into data handling content. In addition, reviewing the relevant chapters of the course book Ünlü, M. (Ed.) (2020). Uygulama örnekleriyle matematik öğretiminde yeni yaklaşımlar is strongly advised.	*This week focuses on enabling students to design creative, pedagogically sound, and curriculum-aligned instructional plans related to the data handling learning domain. The process will be supported through project-based learning, collaborative group work, and instructional design workshops. Students will develop classroom-appropriate lesson activities that incorporate data representations such as statistical graphs, tables, charts, and infographics. A constructivist approach will be adopted, encouraging students to structure their own learning and justify their instructional decisions. Learning will be enriched through student presentations, peer evaluations, and reflective discussions. Constructed teaching plans will be reviewed through feedback and group-based critique sessions.	Ö.Ç.5 Ö.Ç.5 Ö.Ç.5
15.Week	*In-class instructional practices related to the probability learning domain			*In preparation for this week’s topic, “In-class instructional practices related to the probability learning domain,” students are expected to review fundamental concepts related to probability and examine the learning outcomes outlined in the current national mathematics curriculum published by the Ministry of National Education. Additionally, students are required to design lesson plans aligned with contemporary instructional approaches such as Realistic Mathematics Education, Problem-Based Learning, Flipped Learning, Collaborative Learning, and STEM, specifically tailored to the probability content area. To support this process, relevant sections of the course textbook, Ünlü, M. (Ed.) (2020). Uygulama örnekleriyle matematik öğretiminde yeni yaklaşımlar, should be studied in advance. Students are also encouraged to reflect on and incorporate ideas from learning designs developed in previous weeks to enrich their instructional planning.	*In this week, students will plan and present instructional activities related to the probability learning domain using a variety of teaching methods and techniques. Contemporary approaches such as realistic mathematics education, problem-based learning, flipped learning, collaborative learning, STEM-based instruction, art-integrated teaching, creative drama, and project-based learning will be emphasized. Students will share and analyze their instructional designs through group work, classroom discussions, interactive presentations, and peer evaluations. These methods aim to enhance both pedagogical skills and the integration of content knowledge with effective teaching strategies. Additionally, digital tools and instructional technologies will be integrated into the process to enrich the effectiveness of teaching strategies.	Ö.Ç.5 Ö.Ç.5 Ö.Ç.5 Ö.Ç.5 Ö.Ç.5

Assesment Methods %
1 Ara Sınav : 40.000
3 Final : 0.000
4 Ödev : 60.000

ECTS Workload			
Activities	Count	Time(Hour)	Sum of Workload
Vize	1	1.00	1.00
Ara Sınav Hazırlık	7	2.00	14.00
Ödev	7	2.00	14.00
Ders Öncesi Bireysel Çalışma	14	3.00	42.00
Derse Katılım	14	2.00	28.00

Activities	Count	Time(Hour)	Sum of Workload
Rapor	1	1.00	1.00
Total : 100.00			
Sum of Workload / 30 ( Hour ) : 3			
ECTS : 3.00			

Program And OutcomeRelation																									
	P.O. 1	P.O. 2	P.O. 3	P.O. 4	P.O. 5	P.O. 6	P.O. 7	P.O. 8	P.O. 9	P.O. 10	P.O. 11	P.O. 12	P.O. 13	P.O. 14	P.O. 15	P.O. 16	P.O. 17	P.O. 18	P.O. 19	P.O. 20	P.O. 21	P.O. 22	P.O. 23	P.O.	
L.O. 1	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0	
L.O. 2	4	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4	4	0	0	4	0	0	4	
L.O. 3	0	0	0	0	4	0	0	4	4	0	0	0	0	0	0	4	4	4	0	0	4	0	0	4	
L.O. 4	4	0	0	0	0	4	0	0	4	4	0	0	0	0	0	4	4	4	0	0	0	0	0	0	
L.O. 5	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4	0	4	0	0	4	0	0	4	
Avarage	2.40	0	0.80	0	0.80	0.80	0.80	0.80	1.60	1.60	0	0	0	0	0	4.00	2.40	4.00	0	0	2.40	0	0	2.40	
4																								▶	

BEWARE OF PLAGIARISM! Please pay attention to proper academic citation rules and avoid plagiarism, an unethical and academically fraudulent behavior, when completing reports, assignments, or other academic works, and it is treated with the same disciplinary action as cheating in a classroom setting. It is imperative to refrain from presenting another person s ideas, language, expressions, or any other form of intellectual property as your own. Regardless of quality, your assignments/projects/research should reflect your original work. Perfection is not a requirement, and in case of any uncertainties regarding academic writing guidelines, you may seek clarification from your course instructor.

Engel Durumu/Uyarlama Talebi : Engel durumuna ilişkin herhangi bir uyarlama talebinde bulunmak isteyen öğrenciler, dersin öğretim elemanı ya da Nevsehir Engelli Öğrenci Birimi ile en kısa sürede iletişime geçmelidir.