TEACHING OF ALGEBRA

1	Course Title:	TEACHING OF ALGEBRA
2	Course Code:	İMÖ3002
3	Type of Course:	Compulsory
4	Level of Course:	First Cycle
5	Year of Study:	3
6	Semester:	6
7	ECTS Credits Allocated:	5.00
8	Theoretical (hour/week):	3.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Prof. Dr. DİLEK SEZGİN MEMNUN
15	Course Lecturers:	Prof.Dr. Dilek SEZGİN MEMNUN
16	Contact information of the Course Coordinator:	Prof.Dr. Dilek SEZGİN MEMNUN Adres: Bursa Uludağ Üniversitesi Eğitim Fakültesi, Matematik ve Fen Bilimleri Eğitimi Bölümü, Matematik Eğitimi Anabilim Dalı, 16059 Görükle / Bursa E-Mail:dsmemnun@uludag.edu.tr
17	Website:	
18	Objective of the Course:	Understanding the importance of algebraic thinking and algebraic thinking in teaching mathematics; pre-algebra and the study of the historical development of algebra; understanding of arithmetic-algebra relationship and generalized arithmetic and functional thinking; determination and discussion of Algebra concepts in the curriculum; evaluation of the role of technology and material design in Algebra teaching and learning; introduction of methods and approaches used in Algebra learning and teaching, and preparing Algebra activities; teaching of different variables, algebraic expressions, equations, linear equations, identical transformations and inequalities (organizing course content, using appropriate teaching materials and strategies, etc.); evaluating student knowledge on these issues (understanding and interpreting students' thinking about these concepts, knowing the difficulties, mistakes, misconceptions and their reasons for students); to reveal the relationship of the subjects with daily life and other courses, teaching of functional thinking.
19	Contribution of the Course to Professional Development:	Understanding the importance of algebraic thinking in mathematics teaching; To have knowledge about the pre-algebra period and the historical development of algebra; To know the relationship between arithmetic and algebra; knowing the role of technology and material design in algebra teaching and learning; knowing the methods and approaches used in algebra learning and teaching and using them in algebra activities; different representations in algebra teaching; teach the subjects of variables, algebraic expressions, equations, linear equations, identical transformations and inequalities; To be able to evaluate student knowledge on these issues; Associating algebra subjects with daily life and other courses, Knowing the importance and teaching of functional thinking.
20	Learning Outcomes:	
		1	Gains knowledge about the pre-algebra period and the historical development of Algebra.

	2	Gains knowledge of algebraic thinking, the dimensions and development of algebraic thinking. Understands the importance of algebraic thinking in mathematics teaching. Associates Algebra subjects with daily life and other courses. Understands the relationship between arithmetic and Algebra, generalized arithmetic and the importance of functional thinking.
	3	Knows the different methods and approaches of teaching Algebra subjects. Evaluates the use of technology in algebra teaching and learning. Understand how to create learning environments that support algebra teaching and learning.
	4	Becomes aware of affective properties in teaching and learning algebra, learning difficulties encountered in Algebra, misconceptions and solutions. Knows the subjects of Algebra in the curriculum.
	5	Teaches algebraic expression and variable concept in Algebra teaching.
	6	Teaches the concepts of equality and identical transformation in Algebra teaching.
	7	Teaches the concept of equation and inequality in Algebra teaching.
	8	Teaches linear relations and linear equations in Algebra teaching.
	9	Understands the relationship between Algebra learning area and patterns. Knows the place of patterns in the curriculum. Knows student mistakes and misconceptions in learning the concept of pattern.

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	1.00	14.00
Homeworks	2	14.00	28.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	21.00	21.00
Others	0	0.00	0.00
Final Exams	1	42.00	42.00
Total Work Load			168.00
Total work load / 30 hr			4.90
ECTS Credit of the Course			5.00

	Course Content:	
Week	**Theoretical**	**Practice**
1	Explanation of course rules and processing, resources. The pre-algebra period and the	
2	Algebraic thinking, dimensions and development of algebraic thinking. Relating of courses. The relationship between arithmetic and algebra, the importance of generalized	
3	Different methods and approaches for teaching Algebra topics. The use of	
	Algebra subjects. Creating learning environments that support algebra teaching and learning.	
4	To be aware of affective properties in teaching and learning algebra, learning difficulties encountered in algebra, misconceptions and solutions. To examine the subjects of algebra in the curriculum.	

5	The concept of variables and algebraic expression in teaching algebra. The place of the variable concept in the curriculum, Algebra learning and its relationship with other learning areas. Difficulties and misconceptions encountered in teaching the concept of algebraic expression and variable. The place of the concept of variable in daily life and its relation with other courses. Arranging course content and activity applications for the concept of variable. Teaching the concept of algebraic expression and variable in Algebra instruction.	
6	The concept of equality in teaching algebra. The place of the equality concept in the curriculum, Algebra learning and its relationship with other learning areas. Difficulties and misconceptions encountered in teaching the concept of equality. The place of the concept of equality in daily life and its relation with other courses. Arranging course content and activity applications for the concept of equality. Teaching the concept of equality in Algebra instruction.	
7	The identical transformation in teaching algebra. The place of the identical transformation in the curriculum, Algebra learning and its relationship with other learning areas. Difficulties and misconceptions encountered in teaching the identical transformation.	
8	The place of the identical transformation in daily life and its relation with other courses. Arranging course content and activity applications for the identical transformation. Teaching the identical transformation in Algebra instruction.	
9	The concept of equation in teaching algebra. The place of the equation concept in the curriculum, Algebra learning and its relationship with other learning areas. Difficulties and misconceptions encountered in teaching the concept of equation.	
10	The place of the concept of equation in daily life and its relation with other courses. Arranging course content and activity applications for the concept of equation. Teaching the concept of equation in Algebra instruction.	
11	The concept of inequality in teaching algebra. The place of the inequality concept in the curriculum, Algebra learning and its relationship with other learning areas. Difficulties and misconceptions encountered in teaching the concept of inequality. The place of the concept of inequality in daily life and its relation with other courses. Arranging course content and activity applications for the concept of inequality. Teaching the concept of inequality in Algebra instruction.	

12	The concept of linear equations in teaching algebra. The place of the linear equations in the curriculum, Algebra learning and its relationship with other learning areas. Difficulties and misconceptions encountered in teaching the linear equations. The place of the linear equations in daily life and its relation with other courses. Arranging course content and activity applications for the linear equations. Teaching the linear equations in Algebra instruction.	
13	Algebra learning and its relationship with patterns. The place of patterns in the curriculum. The concept of pattern, student mistakes and misconceptions in teaching the pattern.	
14	Functional thinking, the place of functional thinking in curriculum. Teaching of functional thinking and the role of technology in teaching functional thinking.	

22	Textbooks, References and/or Other Materials:	Sarpkaya-Aktaş, G. (Ed). Uygulama Örnekleriyle Cebirsel Düşünme ve Öğretimi. Ankara:Pegem Akademi. Bingölbali, E. & Özmantar, M.F. İlköğretimde Karşılaşılan Zorluklar ve Çözüm Önerileri. Ankara:Pegem Akademi. Dede, Y., Doğan, M.F. ve Aslan-Tutak, F. (Eds.) Matematik eğitiminde etkinlikler ve uygulamaları. Anakara: Pegem Akademi. Ün-Açıkgöz, K. Aktif öğrenme. İzmir:Biliş. Arseven, A. Matematik öğretim yöntemleri. Ankara: pegem Akademi. Özmantar, M.F., Akkoç, H., Kuşdemir-Kayıran, B. ve Özyurt, M. (Eds.) Ortaokul matematik öğretim programları: Tarihsel bir inceleme. Ankara: Pegem Akademi. Çorlu, s. ve Çallı, E. STEM Kuram ve uygulamaları. Öğretmenler için temel kılavuz. Ankara: Pusula Yayıncılık. Van de Walle, J.A., SKarp, K.S. (Durmuş S. (Çeviri Ed)). İlkokul ve ortaokul matematiği. Gelişimsel yaklaşımla öğretim. Ankara: Nobel akademik yayıncılık. Mersin, N. Uygulama örnekleriyle matematik tarihi etkinlikleri ve sınıf içinden yansımalar. Ankara: Nobel yayıncılık.
23	Assesment	

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Midterm Exam	1	15.00
Quiz	0	0.00
Home work-project	2	25.00
Final Exam	1	60.00
Total	4	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		Explanation, active learning, case study, discussion and homework approaches, methods and techniques are used in the teaching of the course.

24	**ECTS / WORK LOAD TABLE**

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	2	1	1	1	5	1	1	2	1	1	1	3	4	3	1	2
ÖK2	1	2	1	2	5	1	1	2	1	1	2	3	3	2	1	1
ÖK3	1	5	1	3	1	2	1	1	2	1	1	1	1	5	4	4
ÖK4	1	2	3	1	4	5	1	1	4	5	2	1	1	1	1	5
ÖK5	4	5	3	3	3	4	4	5	4	3	5	1	1	5	4	4
ÖK6	4	4	3	4	3	4	4	5	4	3	4	1	1	5	4	4
ÖK7	5	4	3	4	3	4	4	4	4	3	4	1	1	5	4	4
ÖK8	5	4	3	3	4	4	4	5	4	3	4	1	1	4	4	4
ÖK9	4	5	3	4	3	5	4	4	4	3	1	1	1	5	5	4
ÖK10	5	5	5	4	4	4	4	4	4	4	1	1	1	5	5	5
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	1 very low		2 low		3 Medium		4 High			5 Very High						