

METHODS OF ARGUMENTATION AND PROOF

1	Course Title:	METHODS OF ARGUMENTATION AND PROOF
2	Course Code:	MAT3105
3	Type of Course:	Optional
4	Level of Course:	First Cycle
5	Year of Study:	3
6	Semester:	5
7	ECTS Credits Allocated:	4.00
8	Theoretical (hour/week):	3.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	None
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Doç. Dr. DİLEK SEZGİN MEMNUN
15	Course Lecturers:	
16	Contact information of the Course Coordinator:	Y.Doç.Dr. Menekşe Seden TAPAN BROUTIN tapan@uludag.edu.tr 0 224 2942162 Uludağ Üniversitesi Eğitim Fakültesi, A Blok, İlköğretim Bölümü, 16059 Nilüfer, Bursa
17	Website:	
18	Objective of the Course:	Conceptualizing mathematical proof methods and basic proof theories in didactics of mathematics, and making analyzes based on these theories.
19	Contribution of the Course to Professional Development:	
20	Learning Outcomes:	
	1	Axiomatic structure of mathematics will be internalized.
	2	Basic proof methods are analyzed and used
	3	Differences between mathematical reasoning, explanation, argumentation and proof methods can be explained with a educational viewpoint.
	4	The place and importance of proof in mathematical science can be explained.
	5	Basic proof teaching theorems are learnt and articles related with these theorems are analyzed.
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21	Course Content:	
	Course Content:	
Week	Theoretical	Practice
1	Axiomatic structure in Maths, proving and methods of proving	

2	Direct proof, proof with deduction and its examples	
3	Proof-by-contradiction and contradiction principle. Examples.	
4	Proves with examples and reverse examples and their exercises.	
5	Place of proof in mathematical study and theorems of basic proof teaching	
6	Mathematical reasoning, explanation, argumentation and proof	
7	Development of mathematical consideration of children and Van Heil Model	
8	Scientific article research based on the theory of Van Heile	
9	Proof structures of Duval and proof gradations of Balacheff	
10	Scientific article research based on the theory of Balacheff	
11	The proof theory of Harel and Sowder and concept of proof scheme	
12	Scientific article research based on the theory of Harel and Sowder	
13	Proof concepts of Hanna, Tall. Mariotti, Batista	
14	Synthesis of all theories of proof	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	28.00	28.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	28.00	28.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	2.00	2.00
Others	0	0.00	0.00
Final Exams	1	20.00	20.00
Total Work Load			60.00
Total work load/ 30 hr			2.00
ECTS Credit of the Course			4.00

		<p>Battista, M. T. & Clements, D. H. (1995). Geometry and proof. <i>Mathematics Teacher</i>, 88(1), 48–54.</p> <p>Balacheff, N. (1999). Apprendre la preuve. In: Sallantin J., Szczeciniarz J. J. (eds.) <i>Le concept de preuve à la lumière de l'intelligence artificielle</i> (pp.197–236). Paris: PUF.</p> <p>(Balacheff on 1987).</p> <p>Stylianides, A. J. (2007). Proof and Proving in School Mathematics, <i>Journal for Research in Mathematics Education</i>, 38(3), pp. 289-321.</p>
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23	Assesment	
TERM LEARNING ACTIVITIES	NUMBE R	WEIGHT
Midterm Exam	1	40.00
Quiz	0	0.00

Home work-project	0	0.00
Final Exam	1	60.00
Total	2	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		
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	5	2	3	1	5	1	5	1	0	0	0	1	0	0	0	0
ÖK2	5	4	3	2	5	2	5	1	0	0	0	2	0	0	0	0
ÖK3	5	5	3	4	5	2	5	1	0	2	4	5	0	0	0	1
ÖK4	5	5	4	4	5	4	5	2	0	2	3	4	0	0	0	0
ÖK5	5	2	5	3	5	5	5	3	0	4	2	3	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	1 very low		2 low		3 Medium		4 High		5 Very High							