



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Algebraic Thinking							
Course Code		MTE520		Course Level		Second Cycle (Master's Degree)			
ECTS Credit	8	Workload	200 (<i>Hours</i>)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		At the end of this course students will gain knowledge about perspectives of algebraic thinking and will be able to conduct research on algebraic thinking.							
Course Content		Development of algebraic thinking of individuals, perspectives of geometric thinking, working on activities to foster algebraic thinking, and literature review of algebraic thinking.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Discussion, Case Study, Problem Solving					
Name of Lecturer(s)		Lec. Deniz ÖZEN ÜNAL							

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	70

Recommended or Required Reading

1	Driscoll, M. (1999). Fostering Algebraic Thinking: A Guide for Teachers, Grades 6-10. Heinemann, 361 Hanover Street, Portsmouth, NH 03801-3912.
2	Arcavi, A. (1995). Teaching and learning algebra: Past, present, and future. The Journal of Mathematical Behavior, 14(1), 145-162.
3	Kieran, C. (2004). Algebraic thinking in the early grades: What is it. The Mathematics Educator, 8(1), 139-151.
4	Kieran, C. (1992). The learning and teaching of algebra. Handbook of research on mathematics teaching and learning, 390-419.

Week	Weekly Detailed Course Contents	
1	Theoretical	The nature of algebraic thinking, what is algebraic thinking, basic concepts of algebraic thinking
2	Theoretical	The development of algebraic reasoning
3	Theoretical	The generalization perspective in the development of algebraic reasoning
4	Theoretical	The problem solving perspective in the development of algebraic reasoning
5	Theoretical	The modelling perspective in the development of algebraic reasoning
6	Theoretical	The modelling perspective in the development of algebraic reasoning
7	Theoretical	The functional perspective in the development of algebraic reasoning
8	Intermediate Exam	Midterm exam
9	Theoretical	The functional perspective in the development of algebraic reasoning
10	Theoretical	The use of technology in the development of algebraic reasoning
11	Theoretical	The student difficulties and misconceptions in the development of algebraic thinking
12	Theoretical	The student difficulties and misconceptions in the development of algebraic thinking
13	Theoretical	Investigation and evaluation of studies, evaluations of curriculums.
14	Theoretical	Investigation and evaluation of studies, evaluations of curriculums.
15	Theoretical	Investigation and evaluation of studies, evaluations of curriculums.
16	Final Exam	General assesment

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	5	3	112
Midterm Examination	1	38	2	40



Final Examination	1	46	2	48
Total Workload (Hours)				200
[Total Workload (Hours) / 25*] = ECTS				8
*25 hour workload is accepted as 1 ECTS				

Learning Outcomes

1	Explain algebra and algebraic thinking.
2	Investigate transition from arithmetic to algebra, quantitative reasoning and the development of algebraic reasoning.
3	Analyze the basic concepts of algebraic thinking.
4	Investigate students' difficulties in algebraic thinking and misconceptions.
5	To be able to write academically specific to the field.

Programme Outcomes (Mathematics Education Master)

1	Learns sufficient theoretical knowledge in the field of mathematics education
2	Uses theoretical knowledge in educational settings
3	Integrates mathematics education knowledge with the other disciplines and products functional knowledge
4	Uses information and communication technologies efficiently in conceptual learning
5	Finds scientific solutions to the problems in the field of mathematics education
6	Evaluates the knowledge critically in the field
7	Participates team projects in the mathematics education field
8	Shares national and international data in the field of mathematics education
9	Comprehends and evaluates science-technology-society and mathematics interactions
10	Comprehends mathematics under the ethical values and takes account of ethical considerations
11	Follows the current development in the mathematics education field
12	Develops strategical plans and evaluates them in the context of quality processes
13	Adopts lifelong learning strategies to his/her studies

Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1	L2	L3	L4	L5
P1	5	5	5	5	4
P2	5	5	5	5	
P3	5	5	5	5	
P4	5	5	4	4	
P5	5	5	5	5	
P6	5	5	5	5	
P7	5	5	5	5	
P8	5	5	5	5	
P9	5	5	5	5	
P10	4	4	4	4	
P11	5	5	5	5	
P12	5	5	5	5	
P13	4	4	4	4	

