

MTE 301

Student Learning Outcomes

This course is aligned directly with the following standards:

- InTASC Model Core Teaching Standards (see http://www.ccsso.org/Documents/2011/InTASC_Model_Core_Teaching_Standards_2011.pdf)
- National Council of Teachers of Mathematics (NCTM) Elementary Mathematics Standards: <http://www.nctm.org/standards/content.aspx?id=2978>
- NETS-T standards (see <http://www.iste.org/standards/nets-for-teachers.aspx>)

Student Learning Outcomes	InTASC	NETS*T	NCTM
Analyze change in various contexts.	4 j, l, o, n	1a, 23c	10.5
To develop relational understanding of essential algebra concepts for teaching mathematics across the K-12 grade span including concepts of equality, equations, and proportional relationships; expressions, equations, and functions; quantity, variables, constants, and unknowns; covariation; rate of change; linear, quadratic, and exponential functions; function families.	4 j, l, o, n	1a	10.1, 10.2, 10.3, 10.4a, 10.5
To engage in generalizing as the essence of thinking in algebra.	4 j, l, o, n	1a	2.4
Distinguish arithmetic from algebraic thinking	4 j, l, o, n	1a	2.4
Match symbolic expressions, diagrams, graphs, tables, and numerical expressions to the situations they describe.	4 j, l, o, n	1a	5.1, 5.2, 5.3, 10.5
Represent and analyze patterns, functions, and mathematical situations using algebraic symbols, tables, graphs, and words.	4 a, b, j, l, o, n	1a, 3c	5.1, 5.2, 10.1, 10.2
Generalize patterns using explicitly defined and recursively defined functions.	4 j, l, o, n	1a	2.4, 3.2, 10.5
Interpret and approximate rates of change from graphical and numerical data.	4 a, b, j, l, o, n	1a	5.1, 5.3, 10.5
Recognize and describe real-world situations involving linear, exponential, and quadratic growth, decay, or decline patterns.	4 j, l, o, n	1a, 3c	10.4a
Recognize and describe special characteristics of linear, exponential, and quadratic patterns in tables, graphs, and equations.	4 j, l, o, n		10.1, 10.2, 10.3,
Translate among various representations – words, tables, graphs, equations – of linear, exponential, and linear functions.	4 a, b, j, l, o, n	1a	5.2, 5.3
Collect real-world data and use various types of functions - linear, exponential, or quadratic – to model the relationship.	4 j, l, o, n 5 l, j, m, o, p, q, r	1a, b 3c, d	5.1

Course Assignments

Grading Scale

		introduce/ reinforce/ assess	Score/ Points	InTASC Standard Assessed	NETS•T	NCTM Elementary Mathematics Standards
1	<i>Algebra-fy Project</i>	introduce/ reinforce	75	4 a, c, f, h 5 m, s	1 a	1.1, 1.2, 2.1-2.4, 4.1, 7.4, 10.1, 10.2, 10.3, 10.4a, 10.5
2	<i>Algebra Wiki Group Project</i>	introduce/ reinforce	75	4 g 5 l, q	3 a, c 4c	1.1, 1.2, 2.1-2.4, 3.1, 3.2, 3.3, 4.1, 7.4, 7.6, 10.6
3	Exam 1	introduce/ reinforce	100	4 a, c, j, n, o		1.1, 1.2, 2.1-2.4, 3.1, 3.2, 3.3, 4.1, 5.1, 5.2, 5.3, 6.1, 7.4, 10.1, 10.2, 10.3, 10.4a, 10.5
4	Exam 2	introduce/ reinforce	100	4 a, c, j, n, o		1.1, 1.2, 2.1-2.4, 3.1, 3.2, 3.3, 4.1, 5.1, 5.2, 5.3, 6.1, 10.1, 10.2, 10.3, 10.4a, 10.5
5	<i>Problem Set 1</i>	introduce/ reinforce	100	4 a, c, j, n, o		1.1, 1.2, 2.1-2.4, 3.1, 3.2, 3.3, 4.1, 5.1, 5.2, 5.3, 6.1, 10.1, 10.2, 10.3, 10.4a, 10.5
6	<i>Problem Set 2</i>	introduce/ Reinforce	100	4 a, c, j, n, o		1.1, 1.2, 2.1-2.4, 3.1, 3.2, 3.3, 4.1, 5.1, 5.2, 5.3, 6.1, 10.1, 10.2, 10.3, 10.4a, 10.5
7	<i>Final Examination</i>	introduce/ reinforce	150	4 a, c, j, n, o 5 l, j, m, p, q, r, s		1.1, 1.2, 1.3, 2.1-2.4, 4.1, 4.2, 4.3, 5.1, 5.2, 5.3, 6.1, 10.1, 10.2, 10.3, 10.4a, 10.5
	Total Points		700			

To receive a grade in this course **ALL** assignments must be completed. Your grade will be based on the number of points earned on all assignments. For example, if you earn 750 out of 1000 points, your grade will be calculated by dividing the number of points you earned (750) by the total number of possible points (1000). Dividing 750 by 1000 (750/1000) results in .75 or 75% – a grade of C.

âA 93 – 100%	C+ 77 – 79%
A- 90 – 92%	C 70 – 76%
B+ 87 – 89%	D 60 – 69%
B 83 – 86%	E < 60%
B- 80 – 82%	

Overview of Assignments

Exams 1 and 2

These exams assess your understanding of topic clusters as they evolve in the course. Exam 1 includes material from classes 1.1 – 4.2. Exam 2 includes material from classes 5.2 – 8.1.

Problem Sets 1 and 2

Problem sets function like homework. Problems target topics and ideas discussed in class. Problems are designed to both reinforce and extend thinking done in class.

Algebra-fy Project

With this algebra content project, you will develop what Kaput and Blanton call your “algebra eyes and ears.” Essentially you insert *generality* into numerically specific arithmetic problems. Researchers call this algebra-fying arithmetic.

Algebra Wiki Group Project

What is algebra anyway? How did it evolve? Has it always been part of the school math curriculum in the United States? What distinguishes algebraic thinking from thinking that is not algebraic? Why is algebra important? Where do we use algebra? In this group project, participants create a wiki that explores these questions.

Final Examination

The final examination is an opportunity to gather all you have learned in the course, and to demonstrate your comprehensive understanding of course material.