

University of West Georgia

Course Syllabus

Algebra for P-8 Teachers I (MATH 3803)

Fall 2007

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Conference Hours: Tuesday (11:00 – 2:00 and 3:30 – 5:30), Wednesday (1:00 – 3:00), and Thursday (11:00 – 2:00). I am available at any other time by Appointment.

Website: mathematics-science.org

Class Time and Location: 9:30 – 10:45 TR, Boyd 307

Text 1: Billstein, R., Libeskind, S., Lott, J., A Problem Solving Approach to Mathematics for Elementary School Teacher, 9th Edition, Addison Wesley, Boston, MA.

Text 2: Becker, J. (2004), Flash Review for Algebra, Addison Wesley, Boston, MA.

Supplementary References: Bennett, Jr. A., Nelson, L., (2004). Mathematics, For Elementary Teachers, A Conceptual Approach. McGraw Hill. Boston, MA.

Student Learning Outcomes

After completion of the course, the student will:

Rational Numbers

1. Model fractions using Pattern blocks, Fraction bars and Fraction grids (area models)
2. Model binary operations on fractions using Pattern blocks, Fraction bars and Fraction grids (area models)
3. Explain and justify traditional algorithms for binary operations on fractions
4. Create equivalent fractions using paper and manipulative
5. Explain why rational numbers are dense on the real numbers; give an example of a number set that is not dense and explain why not
6. Put a set of fractions in order from smallest to greatest
7. Find at least two fractions between a given pair of fractions

Algebra:

1. Explain variables
2. Model Algebraic Expressions and Equations
3. Explore the concepts of Exponential Notation
4. Explore the concept of inequality
5. Model and solve linear equations
6. Graph Linear equations
7. Model and solve linear inequalities

Rectangular Coordinate System

1. Investigate the Cartesian Plane
2. Find the slope of a line
3. Model, write, and solve the equation of a line passing through two given points.
4. Model, write, and solve the equation of a line parallel with another line
5. Model, write, and solve the equation of a line perpendicular to another line

Exponents and Polynomials

1. Model and perform addition and subtraction of polynomials
2. Model and perform addition and subtraction of exponents
3. Model and perform multiplication and division of polynomials
4. Model and perform multiplication and division of exponents
5. Explore, model, and compute scientific notation to describe very large or very small numbers

Quadratic Equations

1. Model and solve quadratic equations by factoring
2. Model and solve quadratic equations using quadratic formula

In the context of the above expectations, a student will:

Mathematical processes

1. Make conjectures and use deductive methods to evaluate the validity of conjectures
2. Recognize that a mathematical problem can be solved in a variety of ways, evaluate the appropriateness of various strategies, and select an appropriate strategy for a given problem
3. Evaluate the reasonableness of a solution to a given problem
4. Use physical and numerical models to represent a given problem or mathematical procedure
5. Recognize that assumptions are made when solving problems and identify and evaluate those assumptions
6. Explore problems using verbal, graphical, numerical, physical, and algebraic representations

Mathematical Perspectives

1. Appreciate the contributions that different cultures have made to the field of mathematics and the impact mathematics has on society and culture
2. Understand and apply how mathematics progresses from concrete to representation to abstract generalizations

Communication

1. Communicate mathematical ideas and concepts in age-appropriate oral, written and visual forms for a class presentation
2. Use mathematical processes to reason mathematically, solve mathematical problems, make mathematical connections within and outside of mathematics, and communicate mathematically
3. Reflect on personal learning, change of attitude and beliefs, and growth in understanding through mathematical journaling

4. Translate mathematical statements among developmentally appropriate language, standard English, mathematical language, and symbolic mathematics

Technology

Use appropriate technology such as calculators, computer software, and the Internet to explore, research, solve, and compare mathematical situations and problems

Professional Development

Be familiar with the National Council of Teachers of Mathematics and the Principles and Standards for School Mathematics, the NCTM website, and NCTM journals

Course Schedule

Week	Topic
1	Algebra NCTM Standard
1	Fractions
2	Fractions' Rules
2	Adding Fractions
2	Multiplying Fractions
3	Exponents and Roots
4	Ratio and Proportion
5	Decimals
5	Decimals' Rules
6	Percent
7	Simple and Compound Interest
8	Fundamental Concepts of Algebra
9	Distance, Slope, and Midpoint
10	Linear Equations
11	Solving Linear Equations Using Manipulative
12	Polynomials
13	Quadratic Equations
14	x and y Intercepts
14	Minimum and Maximum
15	Equation of a Circle

Instructional Methods and Activities:

Class lectures will include the following: presentation of material and concepts, problem solving techniques, and class discussions.

Quizzes will be given periodically through out the semester.

All tests will be comprehensive.

There is no make up for daily quizzes. There is no make up for the tests unless the student presents a legitimate excuse.

Evaluation and grade Assignment:

Quizzes	20%
Lesson Presentation (s)	10%
Reflection on Algebra Ed. Issues	5%
Graphing Calculator Project	5%
2 Tests	40%
Final Exam	20%

Final grade will be determined by point accumulation as follows:

A	Above 90%
B	80% - 89%
C	70% - 79%
D	60% - 69%
F	Below 60%

Class Policies:

Attendance: Attendance is mandatory.

I expect each student to attend all classes and follow university policy. There are only 3 unexcused or excused absences allowed per semester. If you exceed 3 absences you will **fail** the course. Attendance will be checked each class period and it is your responsibility to sign the attendance sheet.

Conferences: Conferences can be beneficial and are encouraged. All conferences should occur during the instructor's office hours, whenever possible. If these hours conflict with a student's schedule, then appointments should be made. The conference time is not to be used for duplication of lectures that were missed; it is the student's responsibility to obtain and review lecture notes before consulting with the instructor. The instructor is very concerned about the student's achievement and well-being and encourages anyone having difficulties with the course to come by the office for extra help.

Note: If you have a documented disability, which will make it difficult for you to carry out the course work as I have outlined and / or if you need special accommodation or assistance due to disability, please contact me as soon as possible.