Mathematics for Early Childhood Teachers I
MATH 6341
Spring 2016

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Required Materials


A scientific calculator, a pair of scissors, a protractor, and a ruler

Catalog Description

The first mathematics course required to receive the mathematics endorsement. Designed for individuals teaching mathematics in grades K-5, the course focuses on enhancing understanding of the concepts and techniques related to numbers, numeration, numerical operations, and algebraic thinking. Collaboration, critical thinking, hands-on explorations using manipulatives, problem-based inquiry, technological tools, and a variety of print and electronic resources will be used. Prerequisite(s): Permission of instructor.

K – 5 Mathematics Endorsement Standards Addressed

2. (g) 1. The program shall prepare candidates who understand and use the major concepts of mathematics appropriate for grades K-5. Candidates shall:
   (i) demonstrate knowledge of the development, use, and multiple representation of numbers and number systems.
   (ii) demonstrate number sense and knowledge of number systems.
   (iii) model the use of the four basic operations in multiple contexts.
   (iv) use a variety of mental computation techniques.
   (v) apply estimation strategies to quantities, measurements, and computation to determine the reasonableness of results.
   (vi) model, explain, and develop a variety of computational algorithms.
   (xi) describe and represent mathematical relationships.

2. (g) 4. The program shall prepare candidates who use appropriate technology to support the learning of mathematics.

2. (g) 6. The program shall prepare candidates who can identify, teach, and model problem solving in grades K-5.

2. (g) 7. The program shall prepare candidates who use a variety of physical and visual materials for exploration and development of:
   (i) prenumeration concepts,
   (ii) numbers (whole numbers, fractions, decimals, percents) and their relationships,
   (iii) four basic operations with positive and negative rational numbers,
   (vi) algebraic concepts.
Course Objectives

Student in this course will complete the following objectives.

- Identify, explain, and apply the five mathematical processes as given in the NCTM Principles and Standards as well as the eight Standards for Mathematical Practice in CCGPS
- Demonstrate a deep understanding to the different components of various base-b numeration systems including the decimal system;
- Understand and state the underlying notions behind the operations of addition, subtraction, multiplication, and division for whole numbers;
- Understand and state the properties satisfied by whole number operations;
- Use and explain computational algorithms that are written, mental, or use estimation;
- Understand the basic properties of the integers and their meanings as well as the effects of signed number on computation;
- Interpret the basic meaning of a fraction and demonstrate an understanding of the properties of the rational numbers;
- Compute and explain computations with the rational numbers in both fractional and decimal form;
- Use proportional reasoning to solve problems involving ratios, proportions, and percents;
- Demonstrate a deep understanding of functions and their ability to describe numerical relationships and patterns of change;
- Use a variety of representations to describe and interpret functions; and
- Demonstrate a deep understanding of the use of numerical operations to solve simple equations such as linear, quadratic, power, and rational functions.

Course Requirements

Students are expected to

1. Complete the key assessment project. A Georgia Professional Standards Commission (GaPSC) requirement is that each course in the K-5 Mathematics Endorsement program shall include one or more assignments that can be implemented with K-5 students as residency experiences. Your key assessment is to write a detailed lesson plan around a task appropriate for one of the CCGPS domains associated with numeration or numerical operations. Details of the key assessment, the lesson plan template, and the grading rubric will follow. The lesson plan is a required artifact in the portfolio for the endorsement. You will be expected to teach this lesson when taking ECED 6343.

2. Complete in-class explorations. It is expected that when explorations are not completed in class, they will be finished as homework and turned in during the next class period.

3. Complete all homework assignments. Written homework assignments must adhere to the following guidelines. Failure to meet any one of these guidelines will result in an automatic score of zero.
   - Homework assignments are to be written neatly in **pencil**. Any old work or errors should be cleanly erased, not scribbled out. No work should appear in the margins.
• Problems should be listed in the same order in which they are assigned.
• The answer to each problem should be clearly identified.
• At least one line should be left between the end of one problem and the start of the next.
• A statement of the original problem should not be included.
• The answers to some questions will be easily obtained and may only require a single word, phrase, number, figure, or symbol. Writing the limited answer is sufficient.
• The answers to some questions will require computation or problem solving. It is expected that work will be shown and neatly organized.
• The answers to some questions will require explanation. It is expected that the explanation will be written in complete, grammatically correct sentences.

All assignments are due at the beginning of the next class period. Any assignment that is submitted late, but within one week of the due date will be automatically reduced 25%. NO ASSIGNMENT WILL BE ACCEPTED LATER THAN ONE WEEK AFTER THE GIVEN DUE DATE.

4. Complete all tests. Two tests, a midterm and final exam, will be given and will focus on the definitions and properties learned in the course. No make-up tests will be given.

5. The Augusta University attendance policy is in effect. If the student is absent for more than the equivalent of 10% of class time, or 4.5 hours, regardless of cause, then the professor may withdraw the student from the class for excessive absences. However, there is some flexibility in the policy to allow students a reasonable number of absences without penalty for extraordinary personal reasons or for officially representing the university.

BY ENROLLING IN THIS COURSE, YOU ACCEPT ALL CONDITIONS STATED ON THIS SYLLABUS.

Standards of Performance

Grading will consist of four types of assignments: the key assessment, in-class explorations, homework assignments, and tests. A point total for each type of assignment will be kept and the point totals will be weighted a certain percentage for determining the final grade. Grades will be determined in the following manner

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
<th>Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Assessment</td>
<td>30%</td>
<td>100 – 90</td>
<td>A</td>
</tr>
<tr>
<td>Explorations</td>
<td>15%</td>
<td>89 – 80</td>
<td>B</td>
</tr>
<tr>
<td>Homework</td>
<td>20%</td>
<td>79 – 70</td>
<td>C</td>
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<tr>
<td>Tests</td>
<td>35%</td>
<td>69 – 60</td>
<td>D</td>
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<td></td>
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<td>59 ↓</td>
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