

**GOVERNORS STATE UNIVERSITY  
COLLEGE OF EDUCATION/DIVISION OF EDUCATION  
COURSE SYLLABUS**

**Course Title:** Teaching Mathematics in Elementary Schools

**Course Number:** ELED 463

**Credit Hours:** Three (3)

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**Trimester:** Fall 2000

**Catalog Description:**

Introduces prospective teachers to content, methods, and materials for elementary school mathematics. Explores options for making instructional decisions. *Prerequisites: Admission to Teacher Education, EDUC 321, EDUC 322, MATH 320, MATH 322; and concurrent enrollment in ELED 401, ELED 460, and ELED 466.*

**Rationale:**

Mathematics is an internal part of our everyday life. The learning of mathematics is obviously a necessity for elementary school children. However, most of the children in our schools have been taught the algorithms for obtaining correct answers with little understanding of arithmetic operations. Elementary school children need concrete type of mathematical experiences as a basis for understanding number theories and operations. Philosophy, purpose, and place of mathematics laboratory in the elementary school curriculum are also discussed so that students can make intelligent decisions.

**Instructional Objectives:**

Upon completion of the course, the student should be able to:

1. Apply theories pertaining to how children learn mathematics in planning instruction.
2. Compare and contrast various approaches to instruction, such as discovery learning, constructivism, and lectures.
3. Describe appropriate sequencing of mathematics topics within each of the major strands.
4. Identify a wide variety of concrete, instructional aids appropriate for teaching the major topics in the elementary mathematics curriculum and create inexpensive teacher-made aids for this purpose.
5. Identify and apply strategies appropriate for developing problem-solving ability.
6. Implement appropriate instructional models for teaching the meaning of the fundamental arithmetic operations and algorithms.



7. Apply appropriate teaching strategies for developing concepts and skills within each of the major strands at given grade levels.
8. Identify a variety of real-world situations and other curricular areas where mathematical concepts and procedures would be applied.
9. Discuss the relative strengths and weaknesses of printed materials such as textbook series and other curricular materials.
10. Discuss and analyze various grouping strategies in relationship to instructional goals and learning styles.
11. Discuss the strengths and limitations of integrating technology into instruction.
12. Use interview techniques and teacher-made tests to identify student error patterns and suggest appropriate diagnostic and remediation techniques.
13. Discuss and implement methods of individualizing instruction which address student diversity and children with special needs.
14. Discuss the implications of Illinois and NCTM standards for instruction and assessment.
15. Use research, professional journals, and other resources in planning instructional activities.
16. Display a professional disposition toward subject matter, colleagues, and students that they teach.

**Instructional Modalities:**

Most class sessions will be divided into lecture and discussion periods and hands-on activities with concrete materials.

**Required Activities:**

Students will be required to:

1. take and pass the mid-term and final examinations.
2. complete all worksheets and class written activities, if any.
3. read and complete all required assignments in the text.
4. construct an inexpensive teacher-made aid for teaching mathematical concept or application at the level of his/her interest and write a brief report on it. It will be subject of in-class oral presentation.

5. visit, observe and/or participate in two mathematics classrooms, one regular classroom and one special education classroom if applicable. Emphasis should be placed on the mathematical characteristics, needs of students, and teacher's questioning techniques.
6. develop and perform an evaluative interview/testing, record the results, and prescribe learning experiences to alleviate any problems that exist or to further the child's mathematics skills.
7. develop and implement a minimum of three (3) lesson plans to teach a specific mathematical content area based on the interview/testing results. The plan must include: (a) instructional objectives; (b) teaching materials to be used (text and/or manipulative materials); (c) teaching procedures, including motivational techniques; (d) evaluation; and (e) enrichment activities, when appropriate.

### **Deadlines for Written Work:**

#### **Session:**

7-8	Teacher-Made Aid (In class presentation)
10	Completion of Mathematics Classroom Visitation (no written work required)
12	Evaluative testing and lesson plans
16	Midterm exam
30	Final exam

### **Evaluation:**

1. Evaluation will be made on the basis of (a) the quality of the class and written work (evaluative interview/test 10%, attitude inventory (5%), lesson plans, 18%), (b) the scores on the mid-term (20%), (c) the presentation of teacher-made aid (12%), (d) the score on the final examination (25%), and (e) attendance & participation (10%). **Good attendance is required.**

The guidelines of grading system for this course will be as follows:

- A - 90-100% proficiency
- B - 80- 89% proficiency
- C - 70- 79% proficiency
- D - 60- 69% proficiency
- F - Below 60% proficiency

2. Students enrolled in this course are required to take ELED 401, Teaching Laboratory II, simultaneously.
3. Those learning activities that involve written work should be typewritten and must be turned in **Before or on** the suggested deadlines.
4. Students enrolled in this course must complete all required work by the end of trimester. **No one will be granted credit after that date.**
- \*5. *A "C" for the mid-term and final examinations is a must for any students who wish to receive at least a "C" for the course.*
6. Make-up test will not be entertained without sufficient supporting evidence.

**Text:**

John A. Van de Walle. Elementary and middle school mathematics - Teaching developmentally. (fourth edition) New York: Longman Publishing, 2000.

**TOPICAL OUTLINE**

<b><u>Instructional Objectives</u></b>	<b><u>Sessions</u></b>	<b><u>Topics and Activities</u></b>	<b><u>Assignment</u></b>	<b><u>Eval.</u></b>
1,3,7	1-4	<b>Attitudes, Goals, &amp; Trends</b> <ul style="list-style-type: none"> <li>• Attitudes concerning mathematics and assessment of math</li> <li>• Reasons for dislike &amp; difficulties</li> <li>• Overview of teaching for meaning and real-world connections</li> <li>• Scope and sequence of math objectives</li> <li>• Meeting individual needs through the use of grouping strategies</li> <li>• How children learn mathematics</li> </ul>	Chapters 1-3; 5; 22-23	1-7
1,2,3,5,6	5-6	<b>Teaching Pre-number, Early number, and Numeration Concepts</b> <ul style="list-style-type: none"> <li>• Concrete to abstract sequencing</li> <li>• Grouping and place-value instructional aids</li> <li>• Forms of expanded notation</li> <li>• Textbook treatment of numeration</li> </ul>	Ch. 6,9	1-3 5,7
1.2.3.5.6.7	7-8 11-12	<b>Whole Numbers</b> <ul style="list-style-type: none"> <li>• Developing operation concepts</li> <li>• Strategies for learning basic facts</li> <li>• Concrete and pictorial models</li> <li>• Estimation</li> <li>• Transitional algorithms</li> <li>• Alternative algorithms</li> <li>• diagnosis of error patterns &amp; effective remediation strategies</li> <li>• Textbook treatment</li> </ul>	7-8;10-11	1-3; 5-7
2	7-8	<b>Teacher-Made Aids due</b>		
1,2,4,5,6,7,8	12	<b>Evaluative interview/testing and lesson plans due</b>		
1,2,3,5,6,7,8	16	<b>Midterm Examination</b>		

1,2,3,5,6,7	14-15; 17-19	<b>Number Theory &amp; Rational Number Concepts &amp; Operations</b> <ul style="list-style-type: none"> <li>• Factors, multiples, primes, composites</li> <li>• Concrete &amp; pictorial models</li> <li>• Equivalent fractions &amp; decimals</li> <li>• Alternative algorithms</li> <li>• Diagnosis of errors</li> <li>• Textbook treatment</li> </ul>	12-14	1-3, 5-7
1,2,3,5,6	20-23	<b>Teaching Geometry &amp; Measurement</b> <ul style="list-style-type: none"> <li>• Awareness geometry</li> <li>• 3D to 1D</li> <li>• Textbook treatment &amp; alternatives</li> <li>• Measurement process</li> </ul> <b>Estimation</b>	16-17	1-3 5-7
1,2,3,4,8	24-25	<b>Problem Solving</b> <ul style="list-style-type: none"> <li>• Small group problem solving</li> <li>• Problem solving process</li> <li>• Points of view on teaching problem solving</li> <li>• Presenting problems at the primary &amp; intermediate/jr. high levels</li> <li>• Questioning &amp; problem extensions</li> <li>• Textbook treatment</li> </ul>	Ch. 4	1-3 5-7
1,2,3,6,8	26-27	<b>Exploring Concepts of Statistics, Probability, Preparing for Algebra</b>	19	1-3 5-7
9	28-29	<b>Using Microcomputers &amp; Calculators in Teaching Mathematics</b>		
1,2,4,5,6,9, 10	30	<b>Final Examination</b>		1

**Related articles from the following periodicals:**

The Arithmetic Teacher  
American Educational Research Journal  
Elementary School Journal  
Exceptional Children  
Harvard Educational Review  
Illinois Mathematics Teacher  
Journal of Education  
Journal of Educational Research  
Journal of Special Education  
Journal of Teacher Education  
Journal of Teaching and Learning  
The Mathematics Teacher  
The Mathematics Teaching  
Peabody Journal of Education  
School Mathematics and Science  
Today's Education  
Theory into Practice  
Journal of Research in Mathematics Education

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