Course Description

This course includes classroom applications of the following ideas: distinction between number and numeral structure in arithmetic; the use of set ideas in understanding the fundamental operations in arithmetic; and a modern approach to the solution of verbal problems, open sentences, number families, patterns in arithmetic, geometry, and informal proofs.

Goals of the Course

1. To provide a context for thinking about mathematics and mathematics education.
2. To emphasize the importance of problem solving and exploration in the mathematics curriculum so that children are actively engaged in reflecting on mathematical ideas.
3. To cover in depth some important ideas in elementary mathematics.
4. To instill the importance of communication and reasoning in the mathematics curriculum.
5. To provide an understanding into making connections among elementary math topics.

Instructional Procedures

This seminar is designed to develop an appreciation and understanding of modern elementary school mathematics. Based on the National Council of Teachers of Mathematics Standards for Curriculum and Evaluation, the course covers a variety of current issues such as cooperative learning, writing, manipulatives, and assessment in mathematics. The seminar is conducted so that it provides a model for the teaching process and includes concepts of problem solving, estimation, logic, communication, and the use of technology. Students will research and discuss mathematical ideas.

Course Content

Some of the following topics (covered in depth):
1. Numeration systems.
2. Whole numbers.
3. Decimals.
4. Fractions.
5. Estimation and mental math.

Evaluation Measures

1. Class participation.
2. Preparation of research assignments.
3. Final project.

Bibliography

A. Required Text


B. Additional Required Reading


Addenda Series: Grades K-6, National Council of Teachers of Mathematics, Reston, VA.

Subject-Matter Books: Grades K-6, National Council of Teachers of Mathematics, Reston, VA.
   Geometry and Spatial Sense
   Making Sense of Data
   Number Sense and Operations
   Patterns

C. Supporting Bibliography

Curcio, Frances R., Developing Graph Comprehension: Elementary and Middle School Activities, National Council of Teachers of Mathematics, Reston, VA, 1989.


D. Relevant Periodical Sources


Teaching Children Mathematics (formerly Arithmetic Teacher), National Council of Teachers of Mathematics.

E. Other Resources

Videos

Mathematics: What are you teaching my child? featuring Marilyn Burns, Scholastic, Inc.*

Mathematics with Manipulatives Series:*
Pattern Blocks
Cuisenaire Rods
Base Ten Blocks
Geoboards
Color Tiles
Six Models

Mathematics: Teaching for understanding. Cuisenaire Company of America.*

Software

Math Shop Jr.*
Math Shop*
Weights and Measures*
Fractions and Decimals*

LOGO turtle geometry*

Manipulatives

Geobords*
Mira Math*
Algeblocks*
Instructor's Cuisenaire Manipulatives Set and resource book*