IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE

COURSE OUTLINE

DIVISION: Mathematics   **DATE:** 4/28/03

COURSE TITLE: Children's Mathematical Thinking   **COURSE NO.:** 114   **UNITS:** 1

    LEC HRS. 1   **LAB HRS.**   **HRS. TBA**
    If cross-referenced, please complete the following

    COURSE NO.(s)   **COURSE TITLE**

I.   **COURSE/CATALOG DESCRIPTION:**

Explore children's mathematical thinking with in-depth analysis of their understanding of operations, place value, algorithms, and multiple representations of problems. Examine interviews of children to assess understanding of mathematics topics, then plan tutoring sessions on basis of interviews.

II.   **A.   PREREQUISITES, if any:**

    B.   COREQUISITES, if any:

    C.   RECOMMENDED PREPARATION, if any:
      Strongly recommend concurrent enrollment in Math 110 or completion of Ma 110 with a C or better.

III.   **GRADING CRITERIA:**

      x   Course must be taken on a "letter-grade" basis only.

             Course may be taken on a "credit" basis or for a letter grade.

             Course must be taken on a "credit" basis only.

IV.   **MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":**

Student will be able to:

1. Demonstrate skill in recognizing representations of mathematical problems and their connections to children's understanding at 70% accuracy.

2. Demonstrate an understanding of problem types and solution strategies for addition and subtraction at 70% accuracy.

3. Demonstrate an understanding of problem types and solution strategies for multiplication And division at 70% accuracy.

4. Demonstrate alternative algorithms and a connection to complex elements of counting at 70% accuracy.

5. Demonstrate an understanding of place value concepts at 70% accuracy.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

CORE CONTENT	APPROX. % OF COURSE

1. Multiple representation and their connections to children's understanding of mathematics
  A. Written symbols
  B. Spoken language
  C. Pictures
  D. Manipulatives
  E. Real-world situations
	20

2. Addition & Subtraction
  A. Problem type
  B. Solving strategies
	20

3. Multiplication & Division
  A. Problem type
  B. Solving strategies
	20

4. Alternative algorithms
  A. Elements of counting
  B. Complexity of place value
	20

5. Place value concepts
  A. Whole number representation
  B. Analyzing multicultural children's procedure
  C. Multi-base number concepts
	20

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (check all that apply)

Essay	x	**Class Activity**	x	**Written Assignments**	x
Problem Solving Exercise	x	**Final Exam**	x	**Oral Assignments**	x
Skill Demonstration	x	**Objective**	x	**Quizzes**	x
Other	x				

VII. INSTRUCTIONAL METHODOLOGY: (Check all that apply)

Lecture	x	**Discussion**	x	**Demonstration**	x
Audio Visual	x	**Group Activity**	x	**Lab Activity**	
Computer Assisted Instruction	x	**Individual Assistance**	x	**Simulation/ Case Study**	x

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit. x

Other x

VIII. TEXTBOOK(S) AND SUPPLEMENT(S):

Refer to the current textbook list and syllabi.

Supplements:

Kamii, C. & Housman, L.B. (1999). <u>Young Children Reinvent Arithmatic: Implications of Piaget's Theory, Second Edition.</u> New York: Teachers College Press.

Carpenter, Thomas P. & Fennema, Elizabeth. (1999). <u>Children's Mathematics.</u> New Hampshire: Heinemann.

Baroody, Arthur J. (1987) <u>Children's Mathematical Thinking: A Developmental Framework for Pre-School, Primary and Special Education Teachers.</u> New York: Teachers College Press.