

CHAMINADE UNIVERSITY OF HONOLULU	Winter-Evening, 2001
Course: ED 445 Mathematics : Curriculum and Methods	
Instructor: Jolyne Rego, Med	
Location: Montessori School 4f Maui	School: 573-0374
2933 Baldwin Avenue	Classroom: 573-4704
Makawao, Hawaii 96768	Home: 986-8167
Time: Monday, 5:30 - 9:30 PM	Email:
January 8 - March 12	jolyne.rego@gte.net
Credits: 3 credits, 45 hours	

RATIONALE

The National Council of Teachers of Mathematics (NCTM) states, "knowing math is doing math." This applies to all levels of instruction, pre-K through grade 12. This course will focus on the development of mathematical concepts from early childhood through ~~grade~~ 3. The course will demonstrate how to teach these concepts using manipulatives and providing experiences that allow children to construct their own understanding.

OBJECTIVES

1. To examine current research on development and learning for its applicability to current trends and best practice in early childhood/elementary ~~classrooms~~.
2. To make students aware of the NCTM standards and discuss implications for practice.
3. To present the Montessori math sequence of activities for early childhood education.
4. To facilitate the development of the skills necessary to design and present developmentally appropriate math activities and lessons.
5. To facilitate the development of the knowledge and skill needed to sequence math-learning experiences.
6. To explore the management implications of using learning centers, manipulatives, cooperative learning and small group strategies.
7. To explore a variety of assessment tools appropriate to **constructivist** learning strategies.
8. To provide a constructivist-learning environment with a math-learning center as a model for pre-service teachers that incorporates cooperative learning and manipulative strategies.
9. To provide pre-service teachers with math learning experiences that can facilitate construction of their own knowledge of math concepts as they develop an understanding of and appreciation for how they themselves **learn** and think about math.
10. To provide an experience with the implementation of NCTM standards of ~~the~~ the local level through observation at selected schools.

OUTCOMES

Upon successful completion of this course, students will be able to:

- Apply current research on how children learn math to their own teaching practice.
- Implement NCTM standards in their own practice in keeping with recent research findings about how children learn math.
- Demonstrate math concepts using Montessori math materials for early childhood education.
- Design and create developmentally appropriate math activities that enhance their school's math curriculum.
- Set up a learning center and use it to create a developmentally appropriate sequence of math learning activities.
Employ appropriate management strategies to facilitate cooperative learning strategies, use of learning centers and of manipulative math materials to involve students in their own learning process.
- Create an environment in which children construct their own knowledge and understanding of math concepts.
- Employ alternative assessment models that are appropriate for "doing math" with manipulatives.
- Engender excitement about math because they have a better understanding of how math works.

COURSE STRATEGIES:

Review of text; lecture; demonstrations of math materials and lessons; practice with materials; participation in discussions; assignments; and project presentations.

COURSE REQUIREMENTS

Attendance and Participation	30 points
Text Presentation	30 points
Curriculum Manual	40 points
Observations	10 points
Children's Math Literature Bibliography	10 points
Professional Journal Articles	15 points
Activity Write-ups	60 points
Self-Assessment	5 points
Total: 200 points	

TEXT

Smith, Susan Sperry, Early Childhood Mathematics, 2nd Edition, Allyn and Bacon, 2001

ASSIGNMENTS: Any written assignments will be submitted computer-generated, and double-spaced.

1. **Attendance and Participation** **3 points per class, 30 points total**
In order to gain an understanding of these teaching principles, it is necessary to **attend class and to participate** in class activities and discussions. Two points will be given for each class attended. One point will be given for participation in the class. Points will be deducted for each class session missed. In addition, missing the equivalent of six (6) points will automatically lower your grade by one level. If a student should miss anymore than that, he/she will be advised to retake the class.

2. **Text** **10 points each, 30 points total for the presentation**
Read the text following the course outline and content. Each student will be assigned a chapter to be presented to the class at each session. The presentation should include:
 - An overview of the key mathematical principles (10 points)
 - A synopsis of the ideas on how informal and formal learning occurs around a particular mathematical strand (10 points)
 - One (1) presentation of an activity found in the section Ready-Set-Math (10 points)

3. **Mathematics Curriculum Resource Album** **40 points total**
Assemble a Mathematics Curriculum Resource Album. It should include:
 - A Table of Contents (4 points)
 - A Section on the Philosophy of Mathematics Curriculum (6 points)
 - A linear presentation of all the lessons and activities presented, written according to the lesson format; this includes the activity write-ups shared from class members. All class notes must be integrated onto their related lesson. (8 points)
 - Clear illustrations and/or photographs of the materials presented, the extensions, and/or other related activities. (8 points)
 - The packet of Ed 445 handouts, this syllabus, and any other examples and handouts distributed during the class sessions. (4 points)
 - Observation write-ups, Professional journal articles and write-ups, Literature Bibliography, and your Self-Assessment (4 points)
 - Organized (2 points)
 - Tabbed (2 points)
 - Computer generated (2 points)

ASSIGNMENTS (continued)

- 4. Observations** **5 points each, 10 points total**
Observe a Montessori Primary classroom, and a non-Montessori Pre-school classroom. Write up your observations according to the observation format provided by the instructor. Include these observations in your math resource album. Each student will be asked to share insights from their observations with the class as they occur.
- 5. Children's Math Literature Bibliography** **5 points each, 10 points total**
Develop a bibliography of works of children's literature that relates to the math concepts covered in this course. Insert this bibliography into your math resource album. You may add this to the Ed. 440 Language Bibliography and include an updated copy in this Math resource album.
Include:
 - The text's contributions in the sections entitled "Related Children's Literature." (5 points)
 - Other listings (5 points)
- 6. Professional Journals** **5 points each, 15 points total**
Read three (3) articles in professional journals. Write a summary of the article and your own reflections of each article. Copy each article for insertion into your math resource album. Make a second copy of each article to give to the instructor. Include:
 - One article that deals with any aspect of math education
 - One article on Dyslexia and related disorders
 - One article on Multiple Intelligences
- 7. Activity Write-ups** **15 points each, 60 points total**
Four (4) assigned lesson plans need to be submitted to the instructor for review one week after the lesson is presented in class. 15 points will be given for each lesson that is well written (clear, accurate, proper grammar, punctuation, and spelling). After the instructor reviews it, the write-up should then be corrected and enough copies should be made for the class members, as well as for the instructor. Copies should be distributed at the beginning of the following class session.
- 8. Write up a one-page self-assessment of coursework and learning outcomes with earned grade.**

COURSE EVALUATION

184 - 200 points	A
162 - 183 points	B
140 - 161 points	C
124 - 139 points	D
Below 124 points	F

All assignments need to be turned in by March 19, 2001 in order to be computed in your final grade.

An "I" or Incomplete grade is given only when unusual or extenuating circumstances prevent a student from completing the coursework, as it is scheduled. Prior consultation with the instructor is necessary.

Nurse Outline and Content:

- January 8 Introduction to Class
- Introductions
 - Discussion of course, syllabus, and assignments
 - Philosophy of Math Curriculum
 - Chapter 1: Mathematics and You

- January 15 Introduction to Number
Linear Counting - Numeration to 10
- Number Rods
 - Sandpaper Numerals
 - Writing Numerals
 - Association of Number Rods and Numerals
 - Spindle Boxes
 - Odd and Even Game (The Counters Game)
 - Memory Game (of Numbers)
 - Short Bead Stair with Numerals
 - Chapter 2: The Language of Math
 - o Student Presentation
 - Chapter 3: Early Math Concepts
 - o Student Presentation

- January 22 The Decimal System - Base 10**
The Golden Bead Material
- First Presentation: Initial Decimal Tray
 - Introduction to Place Value: Presentation of Quantity
 - Presentation of Symbol
 - Association of Quantity and Symbol
 - Chapter 9: Understanding Our Place Value System
 - o Student Presentation
- January 29 Linear and Skip Counting - Numeration to 1000**
- Search for Ten Snake
 - Teen Board
 - Ten Board
 - Hundred Board
 - Squaring Chains
 - Cubing Chains
 - Chapter 7: Developing Number Sense
 - o Student Presentation
- February 5 Operations on Whole Numbers**
- Bank Game
 - Addition with the Golden Beads
 - Multiplication with the Golden Beads
 - Chapter 8: Problem Solving - Addition and Subtraction
 - o Student Presentation
 - Mid-term Assessment: How are we doing?
- February 12 Operations on Whole Numbers**
- Subtraction with the Golden Beads
 - Division with the Golden Beads
 - Stamp Game
 - Chapter 11: Problem Solving - Multiplication and Division
 - o Student Presentation

February 19 Operations on Whole Numbers

- Dot Board
- Bead Frame
- Chapter 4: Space and Shape
 - o Student Presentation

February 26 Memorization of Math Facts

- Addition Strip Board
- Addition with the Bead Stairs
- Addition Snake (Positive Snake Game)
- Addition Charts
- Chapter 5: Pattern and Function
 - o Student Presentation

March 5 Memorization of Math Facts

- Multiplication Board
- Multiplication Charts
- Multiplication Bead Bars
- Subtraction Board
- Subtraction Charts
- Division Board

March 12 Review

- Chapter 6: Graphing
 - o Student Presentation
- Chapter 10: Measurement
 - o Student Presentation

March 19 Album due.

Student:

Term:

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COURSE REQUIREMENTS AND EVALUATION:

Attendance and Participation	30
Attendance (2 ea.)	
• Absence (-2 ea.)	
• Participation (1 ea.)	
Text	30
• Overview (10)	
• Synopsis (10)	
• Activity (10)	
Curriculum Resource Album	40
• Table of Contents (4)	
• Philosophy (6)	
• Lessons (8)	
• Illustrations (8)	
• Handouts (4)	
• Observations (1)	
• Journals (1)	
• Bibliography (1)	
• Self-Assessment (1)	
• Organized (2)	
• Tabbed (2)	
• Typed (2)	
Observations	10
• Montessori (5)	
• Non-Montessori (5)	
Children's Language Arts Literature Bibliography	10
• Text (5)	
• Other Listings (5)	
Professional Journal Articles	15
• Math (5)	
• Dyslexia (5)	
• Multiple Intelligences (5)	
• Copies for Album	
• Copies for instructor	
(4) Activity Write-ups (15 each)	60
Grade Self-Assessment	5

TOTAL:

GRADE:

Scale:	184 - 200 points	A
	162 -183 points	B
	140-161 points	C
	124-139 points	D
	Below 124 points	F

COMMENTS: