

Northern Marianas College

CURRICULUM ACTION REQUEST

Effective Semester / Session: Fall 2007

Type of Action:

- New
 Modification
 Move to Inactive (Stop Out)
 Cancellation

Course Alpha and Number: ED 432

Course Title: Teaching Elementary and Middle School Mathematics Developmentally

Reason for initiating, modifying, or canceling course, or other pertinent comment:

This course guide has been undated to reflect changes in current educational practices under sections of course activities and design, student learning outcomes and assessment, and new textbook.

Sallie Sablan

Sallie Sablan

July 23, 2007

Proposer

Date

Michael Reber

Michael Reber

July 23, 2007

Department Chair

Date

[Signature]

English and Format Reviewer

10/23/07

Date

[Signature]

Dean of Academic and Student Programs and Services

10/29/07

Date

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Course Guide

Course: ED 432 Teaching Elementary and Middle School Mathematics Developmentally

1. Department:

School of Education

2. Purpose

This course provides elementary and junior high school teachers with the pedagogy and methodology of teaching mathematics in the elementary and junior high school classroom.

3. Description

A. Required/Recommended Textbook(s) and Related Materials

Required:

Van de Walle, John A. *Elementary and Middle School Mathematics, Teaching Developmentally*. 6th Edition. New York: Allyn & Bacon, 2006.

Readability Level: 12

B. Contact Hours

1. **Lecture:** 45 per semester
2. **Lab:**
3. **Other:**

C. Credits

1. **Number:** 3
2. **Type:** Regular degree credits

D. Catalogue Course Description

This course provides teachers-in-training with an examination of fundamental principles of mathematics. It provides the student with methodology, activities, and techniques for teaching elementary and middle school mathematics. It also examines current elementary mathematics standards and the modern mathematics curriculum. This is a required course for the Bachelor of Science degree in Elementary Education. Prerequisites: All core course and general education requirements and ED 330 with a grade of "C" or higher or permission of the Director of the School of Education.

E. Degree or Certificate Requirements Met by Course

This is a required course for the Bachelor of Science in Elementary Education.

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F. Course Activities and Design

This course will incorporate short lectures, videos, student research, field experience, reflections, projects and presentations, journal assignments, and a midterm and final exam.

4. Course Prerequisite(s); Concurrent Course Enrollment; Required English/Mathematics Placement Level(s)

Prerequisites: All core course and general education requirements and ED 330 with a grade of "C" or higher or permission of the Director of the School of Education.

5. Estimated Cost of Course; Instructional Resources Needed

To the Student: Tuition for a three-credit course; cost of textbook; instructional materials fee.

To the College: Instructor's salary.

Instructional resources needed for this course include TV/VCRs, chalkboard, chalk, CRC materials, photocopied materials and other materials as necessary.

6. Method of Evaluation

Student grades will be based on the regular letter grade system as described below:

- A: Excellent – grade points: 4.0;
- B: Above average – grade points: 3.0;
- C: Average – grade points: 2.0;
- D: Below average – grade points: 1.0;
- F: Failure – grade points: 0.0.

NMC's grading and attendance policies will be followed.

7. Course Outline

This is a topical outline and does not necessarily indicate the sequence in which the material will be presented.

1.0 Teaching mathematics in the context of the reform movement

2.0 Exploring what it means to do mathematics

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- 3.0 Developing understanding in mathematics
- 4.0 Teaching through problem solving
- 5.0 Building assessment into instruction
- 6.0 Planning in the problem-based classroom
- 7.0 Teaching all children mathematics
- 8.0 Technology and school mathematics
- 9.0 Developing early number concepts and number sense
- 10.0 Developing meanings for the operations
- 11.0 Helping children master basic facts
- 12.0 Whole-number place value development
- 13.0 Strategies for whole-number computation
- 14.0 Computational estimation with whole numbers
- 15.0 Developing fraction concepts
- 16.0 Computation with fractions
- 17.0 Decimal and percent concepts and decimal computation
- 18.0 Developing concepts of ratio and proportion
- 19.0 Developing measurement concepts
- 20.0 Geometric thinking and geometric concepts
- 21.0 Exploring concepts of data analysis and probability
- 22.0 Algebraic reasoning
- 23.0 Exploring functions

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24.0 Developing concepts of exponents, integers, and real numbers

8. **Instructional Goals**

This course will introduce students to:

- 1.0 Mathematics in the context of the reform movement;
- 2.0 What it means to do mathematics;
- 3.0 Understanding in mathematics;
- 4.0 Teaching through problem solving;
- 5.0 Building assessment into instruction;
- 6.0 Planning in the problem-based classroom;
- 7.0 Teaching all children mathematics;
- 8.0 Technology and school mathematics;
- 9.0 Early number concepts and number sense;
- 10.0 Meanings for the operations;
- 11.0 Helping children master basic facts;
- 12.0 Whole-number place value development;
- 13.0 Strategies for whole-number computation;
- 14.0 Computational estimation with whole numbers;
- 15.0 Fraction concepts;
- 16.0 Computation with fractions;
- 17.0 Decimal and percent concepts and decimal computation;

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- 18.0 Concepts of ratio and proportion;
- 19.0 Measurement concepts;
- 20.0 Geometric thinking and geometric concepts;
- 21.0 Data analysis and probability;
- 22.0 Algebraic reasoning;
- 23.0 Exploring functions; and
- 24.0 Concepts of exponents, integers, and real numbers

9. **Student Learning Outcomes**

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

- 1.0 Explain Teaching mathematics in the context of the reform movement;
- 2.0 Describe what it means to do mathematics;
- 3.0 Describe developing understanding in mathematics;
- 4.0 Discuss teaching through problem solving;
- 5.0 Identify methods of building assessment into instruction;
- 6.0 Describe how to plan in the problem-based classroom;
- 7.0 Describe how to teach all children mathematics;
- 8.0 Discuss how to use technology and school mathematics;
- 9.0 Create lessons and activities focusing on early number concepts and number sense;
- 10.0 Create lessons and activities focusing on how students develop meanings for the operations;

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- 11.0 Create lessons and activities focusing on children mastering basic facts;
- 12.0 Create lessons and activities focusing on whole-number place value development;
- 13.0 Create lessons and activities focusing on strategies for whole-number computation;
- 14.0 Create lessons and activities focusing on computational estimation with whole numbers;
- 15.0 Create lessons and activities focusing on fraction concepts;
- 16.0 Create lessons and activities focusing on computation with fractions;
- 17.0 Create lessons and activities focusing on decimal and percent concepts and decimal computation;
- 18.0 Create lessons and activities focusing on concepts of ratio and proportion;
- 19.0 Create lessons and activities focusing on measurement concepts;
- 20.0 Create lessons and activities focusing on geometric thinking and geometric concepts;
- 21.0 Create lessons and activities focusing on concepts of data analysis and probability;
- 22.0 Create lessons and activities focusing on Algebraic reasoning;
- 23.0 Create lessons and activities focusing on exploring functions; and
- 24.0 Create lessons and activities focusing on concepts of exponents, integers, and real numbers.

10. **Assessment Measures**

Assessment of student learning may include, but not be limited to, the following:

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- 1.0 Class participation
- 2.0 Examinations
- 3.0 Journal assignments
- 4.0 Unit plan
- 5.0 Learning center
- 6.0 Presentations
- 7.0 Service learning tutoring