Effective Semester / Session: Fall 2007

Type of Action:  
- [x] 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  
Proposer  
July 23, 2007

Michael Reber  
Department Chair  
July 23, 2007

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English and Format Reviewer  
10/23/07

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Dean of Academic and Student Programs and Services  
10/29/07
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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:
      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
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
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;
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