

7/26/09

UMEP Math 5910 Syllabus (Fall, 2009)



What's the Name of the Course? Methods of Teaching Mathematics in Secondary and Middle School.

How Many Credits? 3 semester credits.

What Is the Prerequisite? You are an inservice mathematics teacher whose UMEP application has been approved for enrollment in this course and you've successfully completed a calculus course equivalent to Math 1210 or Math 4910-A

Why? To help you apply research-based teaching strategies and techniques that lead secondary and middle school students to discover, create, appreciate, and utilize mathematics that is personally meaningful to them in their own real worlds. The rationale for the course is further articulated in the preface of its textbook.

How is the course conducted? UMEP's Math 5910 in the Fall, 2009 semester is an interactive, distance delivery class. Thirteen class meetings, e-mail, and *Blackboard Visa* are the principal tools for communicating among participants. Sixteen class meetings will be on Tuesdays from 4:30 p.m. to 7:00 p.m. beginning August 25 and ending December 8.

Who is conducting this course? Jim Cangelosi (Office: Lund 325C (Office hours are by appointment); phone: 797-1415; e-mail: jcang@math.usu.edu; Fax: 797-1822) with assistance from Erinn Harris, Stephanie Swainston, and Tamra Bunnell.

What materials do you need? You'll need:

- ▶ The course textbook:

Cangelosi, J. S. (2003). *Teaching mathematics in secondary and middle school: An interactive approach* (3rd ed.). Upper Saddle River, NJ: Prentice-Hall, Inc.

- ▶ Access to one or two school mathematics textbooks (e.g., textbooks you use in your own teaching)
- ▶ Computer disk space for storing the electronic version of your mathematics teaching portfolio
- ▶ A graphing calculator

What are the goals? The course is organized into three units. Each unit has a goal defined by a sequence of objectives. The units and goals are as follows:

Unit 1: Being a Mathematics Teacher Who Orchestrates a Learning Environment in which Students Cooperatively Engage in Meaningful Mathematics

Goal: The goal of Unit 1 is to lead you to (a) examine some preliminary ideas for developing mathematics curricula, (b) develop strategies for gaining and maintaining your students' cooperation, and (c) develop strategies for conducting learning activities so that students willingly and enthusiastically engage in them.

Objectives: Unit 1's goal is defined by the objectives listed for Chapters 1–3 of the textbook; see pp. 1–2, 50, and 88.

Unit 2: Designing Lessons that Lead Students to Do Meaningful Mathematics

Goal: The goal of Unit 2 is to lead you to (a) better understand how you control mathematics curricula and how you need to design and implement your mathematics curriculum so that your students learn meaningful mathematics, (b) develop strategies for designing lessons that lead students to construct mathematical concepts and to discover mathematical relationships, (c) develop strategies for designing lessons that lead students to acquire and remember mathematical information and develop algorithmic skills, (d) develop strategies for designing lessons that lead students to communicate with the language of mathematics and comprehend mathematical messages, and (e) develop strategies for designing lessons that lead students to apply mathematics to real-life situations, foster their creativity with mathematics, and develop an appreciation for and willingness to do mathematics.

Objectives: Unit 2's goal is defined by the objectives listed for Chapters 4–8 of the textbook; see pp. 130, 172, 207, 229, and 254.

Unit 3: Analyzing Mathematics Curricula and Instructional Practice, Employing Technology, and Assessing and Reporting Students' Mathematical Progress

Goal: The goal of Unit 3 is to lead you to develop strategies for assessing and reporting students' mathematical progress, (b) examine resources and technologies available for leading students to do meaningful mathematics and (c) examine examples of teachers attempting to implement strategies you learned from your work with Chapters 1–8.

Objectives: Unit 3's goal is defined by the objectives listed for Chapters 9–11 of the textbook; see pp. 227, 332 and 366.

What are the learning activities in which you'll engage during this course? Here is a tentative schedule of activities:

Mtg #	Focus or Foci of the Meeting	Homework Assignment
1	Developing electronic-based professional portfolio; the complementary roles of inquiry and direct instructional strategies; organizing for instruction	Study pp. 1–47; engage in Activities 1.1, 1.2, and 1.3; engage in Synthesis Activities 1, 2, 4 & 9 from pp. 47–49.
2	Establishing a learning community conducive to doing meaningful mathematics	Study pp. 50–85; engage in Activities 2.2 & 2.3.
3	Engaging students in learning activities	Study pp. 88–128; engage in Activities 3.1 & 3.2.
4	Establishing a learning community conducive to doing meaningful mathematics; engaging students in learning activities; <i>PSSM</i>	Take advantage of Opportunity #1; study pp. 130–164; engage in Activities 4.1 & 4.2.
5	Designing mathematics courses; our advanced organizer for analyzing mathematical content and for specifying cognitive and affective learning levels of our objectives	Study pp. 164–169; engage in Activity 4.3 & Synthesis Activities 1–6 from pp. 169–171.
6	Designing lessons and miniexperiments for construct-a-concept objectives	Engage in Activity 5.4; study pp. 189–192; engage in Activities 5.5 & 5.6.
7	Designing lessons and miniexperiments for discover-a-relationship objectives	Engage in Activities 5.7 & 5.8; study pp. 202–204; engage in Synthesis Activities 1-3 from pp. 204 & 206.
8	Designing lessons and miniexperiments for simple-knowledge objectives	Study pp. 211–218; engage in Activities 6.3–6.5.
9	Designing lessons and miniexperiments for algorithmic-skill objectives	Engage in Activities 6.6 & 6.8 and Synthesis Activities 1–2 from pp. 227–228.
10	Designing lessons and miniexperiments for comprehension-and-communication objectives	Study pp. 239–252; engage in Activities 7.3 & 7.4 and Synthesis Activities 1–2 from pp. 252–253.
11	Designing lessons and miniexperiments for application objectives;	Engage in Activities 8.1–8.3; study pp. Study pp. 366–375.
12	Designing lessons and miniexperiments for creative-thinking objectives	Take advantage of Opportunity #2
13	Assessing and reporting students' progress with mathematics	Study pp. 277–331.
14	Analyzing examples of mathematics teachers practicing their art	Study pp. 375–416.
15	Analyzing more examples of mathematics teachers practicing their art	Prepare to take advantage of Opportunity #3
16	Begin taking advantage of Opportunity #3	Finish taking advantage of Opportunity #3.

How are grades determined? You will be provided with three opportunities to demonstrate progress w/r your achievement of the goals of the three units. These opportunities are tentatively scheduled for the 4th, 11th, and 13th class meetings and will influence the final course grades as follows:

<u>Oppor- tunity</u>	<u>Tentative Date</u>	<u>Units Involved</u>	<u>Relative Influence on Final Grade</u>
#1	09/15/09	1	20%
#2	11/10/09	1, 2	40%
#3	12/08/09	1, 2, 3	40%

What about accommodating exceptionalities? In coordination with the Disability Resource Center, reasonable accommodations will be provided for qualified students with disabilities. If you need accommodations because of special exceptionalities, please meet with Jim during the first week of the semester to make arrangements. Accommodations and alternative format print materials (e.g., large print, audio, diskette or Braille) are available through the Disability Resource Center, located in Taggart Student Center room 104, phone number (435) 797-2444.