

MATH 6990
Topics in Collegiate Mathematics Education
Spring 2009

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The OSU Syllabus Attachment for 2011 Spring semester states all relevant university policies; it is available at:
<http://osu.okstate.edu/acadaffr/aa/syllabusattachment-Spr.htm>

Course Goal and Objectives. The **overarching goal** of this course is for you to better understand and appreciate the components involved in curriculum development (learning, content, and pedagogy) in collegiate level mathematics generally and the role these play in your active involvement in developing curriculum. The subject of "how we got where we are today in collegiate mathematics education" is a subject of another course. The **particular goals** are for you to 1) better understand and appreciate the components of curriculum development (learning, content, and pedagogy), and 2) develop curriculum involving these components for a specific mathematics content area of your choice. The **objectives** related to achieving these particular goals are related to answering the questions

What is the Motivation for a Revision of this Curriculum?

- 1) To understand the progression of significant historical events in the evolution of mathematics education (learning, content, and pedagogy) that have affected the teaching of the area you selected;

What Does Your Curriculum Look Like?

- 2) To develop curriculum materials (learning, content, and pedagogy) that are consistent with your professional beliefs and the historical events considered in 1) -- or, if not consistent, why not;

Is Your Curriculum Really Better, or Just Different?

- 3) To develop assessment measures to determine the effectiveness of your curriculum development.

An Example. Suppose you are a mathematics instructor at a college/university and you think there is a need to "rethink" the way you teach students about the *conic sections in College Algebra*. The particular goals, then, for you is to 1) better understand and appreciate the components of developing a curriculum (learning, content, and pedagogy), and 2) develop curriculum involving these components for the conic sections in College Algebra. Related to this example, the objectives for achieving these particular goals are 1) To understand the progression of significant events in mathematics education (learning, content, and pedagogy) that have affected the teaching of College Algebra generally, and the conic sections specifically; 2) To develop curriculum materials (learning, content, and pedagogy) that are consistent with your professional beliefs and the historical events considered in 1) -- or, if not consistent, why not; 3) To develop assessment measures to determine the effectiveness of your curricular materials for teaching about the conic sections in College Algebra.

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Required Readings

- Robert J. Sternberg, L. Jarvin, and E. Grigorenko. *Wisdom, Intelligence, Creativity, and Success*. Corwin, 2009.

- Reports of Major Committees, Curriculum Projects, Commissions or Task Forces related to the specific content area selected.

Course Requirements

The requirements listed below provide the chronology for completing the Curriculum Development Project (CDP).

1. **Selection of Mathematics Content Area.** This is where it all begins. Develop a brief statement proposing the content area and a rationale for why you want to develop curriculum for it. Your selection must be approved by the instructor.

2. **CDP Proposal.** Once you have an approved content area, you can develop the proposal for your CDP Project. The CDP Proposal includes evidence of 1) researching and identifying the progression of significant historical events in evolution of mathematics education (learning, content, and pedagogy) that have affected the teaching of the area you selected; 2) outlining/drafting ideas for curriculum materials (learning, content, and pedagogy) that are consistent with your professional beliefs and the historical events considered in 1) -- or, if not consistent, why you are rejecting these trends; 3) identifying assessment measures you are thinking about using to determine the effectiveness of your development. Your CDP Proposal must be approved by the instructor and presented to the class.

3. **CDP Draft.** Using your approved CDP Proposal as an outline, you should be able to move ahead with the major portion of the development. You should counsel frequently with your instructor about your progress.

4. **CDP - Final Version.** This is the final version of your CDP for the course. You should submit a hard copy and an e-copy to the instructor prior to the class presentation.

5. **CDP - Final Version Presentation.** Each student will present the CDP to the class.

Course Format

This course will be conducted in a seminar/readings format. Initially, we will meet in a seminar format to discuss common issues. As the semester progresses, and you are more involved in actually writing your curriculum materials, we will meet less frequently in a seminar setting; instead, you will have the opportunity to consult with me individually. Later in the semester, we will again return to the seminar setting where each of you will be able to present your semester's work during one/two class meetings. Informed active participation is expected.

Final Note. Any changes in this syllabus will be communicated to you in class by the instructor.