

 <p>University of Memphis College of Education</p>	College of Education
	University of Memphis
	Instruction and Curriculum Leadership
	ICL 7502 Teaching Mathematics in the Secondary School
	Fall 2009
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College of Education Norms

- I take 100% responsibility.**
- I seek equity of voice.**
- I am willing to talk about sensitive issues.**
- I listen for understanding.**
- I appreciate the strengths and contributions of others.**
- I bring positive energy and encouragement to the team.**
- I commit to the mission of the college.**

ICL 7502-8502: Teaching Mathematics in the Secondary School

Course Description:

Consideration of principles and techniques of teaching mathematics in secondary schools including study and evaluation of materials of instruction.

Prerequisites:

MAT - completion of Level I coursework
MS and Ed.D. - None

Text(s):

Brahier, D. J. (2009). *Teaching secondary and middle school mathematics*. Boston: Allyn and Bacon.

Support of Conceptual Framework: This course is designed for pre-service teachers working with diverse communities to develop teaching knowledge and skills in secondary mathematics.

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Methods of Instruction:

- A. Lecture
- B. Discussion
- C. Readings
- D. Collaborative activities
- E. Videos
- F. Textbooks analysis
- G. Technology
- H. Field experiences
- I. Lesson plans
- J. Research papers

Key Assessments: Mathematics Culture Profile, Unit Plan, Problem Solving Activities, Mathematics History Project, Clinical Faculty Evaluation

Course Objectives:

- A. Study theoretical bases for teaching secondary school mathematics.
- B. Examine current research and its practical applications to teaching mathematics.
- C. Study issues, trends, and recommendation of professional mathematics organizations.
- D. Evaluation of instructional materials, resources, media, and technology for teaching secondary mathematics.

Assignments, Exams, and Grading Criteria:

Assignment	Points
*Mathematics Cultural Profile	25
Student Interview: Part I and Part II	200
Content Analysis Report and Presentation	200
*History of Math Project	75
*Unit Plan	200
*Field experiences (8 hours) – Clinical Faculty Evaluation	25
*Problem Solving Activities	75
Final Exam	200
Total	1000

*These assignments are required for program evaluation and will count both as a grade for the course and as an assessment for the Master’s degree program.

- **Mathematics Culture Profile**

You will submit a profile of yourself from a cultural perspective. This is similar to a mathematics autobiography but with a particular focus on the relationship between mathematics and culture. In particular, you should address the following questions:

As you reflect upon your personal history, what has been the role of mathematics? (e.g., Have you always liked mathematics? If not, what was the turning point? Have you always felt confident in mathematics? etc.)

As you reflect upon your culture, how do you see mathematics in your cultural experiences?

Culture is defined broadly to include the traditions or traits of a particular community or population. These common traits could be based in religion, ethnic background, profession, family, etc.

This profile should be 1 page in length and word processed.

- **Student Interview: Part I and Part II**

You will conduct an interview and complete an analysis of the thinking of a student in your class or residency placement. A description of the assignment and the rubric are available on the eCourseware site.

- **Content Analysis Report and Presentation**

You will work with a group of your peers to complete a report and make a presentation on a specific mathematics topic. Individual grades for this assignment will be pro-rated based upon contribution to the group effort. In other words, a student who does not contribute his/her fair share to the group effort will not receive the same grade as the other group members. A description of the assignment and the rubric are available on the eCourseware site.

- **History of Mathematics in Teaching Project**

Your task is to create classroom activities incorporating the history of mathematics into each of the following content areas: (1) Number and Operations; (2) Algebra; (3) Geometry; (4) Calculus; (5) Discrete Mathematics; (6) Data Analysis, Statistics, and Probability; (7) Measurement.

For each activity, you must provide (1) a list of the materials used; (2) a description of the activity and its relationship to the designated content area; and (3) how you will assess the outcomes of the activity.

Each activity will be worth 10 possible points. The points will be assigned as follows: Connection to Mathematics – 5 points – There is a clear connection between the historical event, person, etc. and the mathematical content addressed in the activity; Resources used – 2 points – The activity draws upon one or more quality resources; Assessment – 3 points – The assessments used actively involve students and adequately assess the outcomes of the activity.

- **Unit Plan**

You will create a unit plan (involving a minimum of 5 lessons) on a topic of your choice. It is recommended, but not required, that you create the unit plan on the same topic researched in the Content Analysis assignment. A description of the assignment and the rubric are available on the eCourseware site.

- **Field Experiences – Clinical Faculty Evaluation**

One of the requirements of the course is that students spend a minimum of 8 hours over the course of the semester working in a mathematics classroom. As a means to evaluate your progress with

respect to the teaching of mathematics, you will be required to have a Clinical Faculty Evaluation completed on a lesson that you teach. If you are in the Residency Track, your cooperating teacher will complete this form. If you are in the Transitional Track, you should ask whoever will observe you during the fall semester (e.g., PDSCC, assistant principal, etc.) to complete the evaluation form during your regular observation. If you are not scheduled to be observed during the Fall semester, please let me know, and other arrangements will be made for the observation. A copy of the Evaluation form is available on the eCourseware site.

- **Problem Solving Activities**

Each week, 2-3 problems will be posted on the eCourseware site. You will have the option of choosing which of the problems you wish to solve for that week. You also will have a Discussion Forum on eCourseware in which you should communicate with other members of the class who are working on the same problem. This is a space to ask questions and make suggestions. However, it is not a space to tell others how to solve the problem. Even if you have no questions regarding the problem, we expect you to participate in the Discussion Forum by providing suggestions or asking questions that might help others who are seeking assistance with the problem. It is important that everyone participate in the Discussion Forum, whether seeking help or offering suggestions, as this dialogue will determine how much (if any) time we devote in the next class period to discussing the problem. Your problem solution for the week must be submitted on eCourseware by Monday at midnight. Your grade for Problem Solving will be based upon both problem completion and participation in the Discussion Forum.

- **Final Exam**

The final exam will be take-home. You will be given approximately 1 week to complete the exam, which will include questions designed to assess your ability to apply the knowledge you have gained during the semester as well as your capacity to reflect upon what you have learned.

Make-up Policy:

The instructor reserves the right to refuse to accept work submitted after the due date. If there are extenuating circumstances, the student should discuss the situation with the instructor and make arrangements before the assignment is past due. If you miss class, you should contact another student in the class for notes and class assignments.

Grading Policy:

A = 900-1000 points
B = 800-899 points
C = 700-799 points
D = 600-699 points
F = Below 600
I = Incomplete

Please note that in keeping with the provisions of the Family Privacy Act, it is the policy of the Department of Instruction and Curriculum Leadership that grades not be posted.

Course Requirements:

Attendance Policy: You are expected to be in class in a timely manner and to actively participate in all activities. Your first absence is a gift. Every two (2) absences thereafter will lower your grade one letter grade in the class. You should keep the instructor informed at all times and call as needed.

Americans with Disabilities Act: The University of Memphis does not discriminate on the basis of disability in the recruitment and admission of students, the recruitment and employment of faculty and staff, and the operation of any of its programs and activities, as specified by federal laws and regulations. *The student has the responsibility of informing the course instructor (at the beginning of the course) of any disabling condition, which will require modification to avoid discrimination.* Faculty are required by law to provide "reasonable accommodation" to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with informing faculty at the beginning of the semester and in providing authorized documentation through designated administrative channels.

Written Assignments and Academic Misconduct: All written work submitted must be the student's original work and conform to the guidelines of the *American Psychological Association* (APA) available online and via their publications. This means that any substantive ideas, phrases, sentences, and/or any published ideas must be properly referenced to avoid even the appearance of plagiarism. It is the student's responsibility to know all relevant university policies concerning *plagiarism*. Any documented cases of plagiarism can and will result in dismissal from the course with a failing grade, and may result in other more serious sanctions by the College of Education.

Tentative Reading/Assignment Schedule

Day	Date	Topic	Reading	Assignment due
Tuesday	9-1	Introduction		
Wednesday	9-2	Mathematical Processes – Introduction	Chapter 1 - Brahier	
Tuesday	9-8	Mathematical Processes – Problem Solving	Stein et al. PSSM – pp. 52-55	Mathematics Culture Profile
Wednesday	9-9	Mathematical Processes- Representation and Connections	PSSM – pp. 64-71	
Tuesday	9-15	Mathematical Processes – Communication	Knuth & Peressini PSSM – pp. 60-63	
Wednesday	9-16	Mathematical Processes – Reasoning/Proof	Knuth PSSM – pp. 56-59	
Tuesday	9-22	Principles of Mathematics Education	Chapter 2 – Brahier	
Wednesday	9-23	Learning Theories	Chapter 3 – Brahier	
Tuesday	9-29	Learning Theories (cont.)		
Wednesday	9-30	Curriculum	Chapter 4 – Brahier	
Tuesday	10-6	Curriculum and Planning	Chapter 5 – Brahier	Student Interview: Part I
Wednesday	10-7	Planning for Instruction	Chapter 6 – Brahier	
Tuesday	10-13	Planning for Instruction (cont.)		
Wednesday	10-14	Teaching Tools and Strategies	Chapter 7 - Brahier	
Tuesday	10-20	Teaching Tools and Strategies		

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Wednesday	10-21	Assessment	Chapter 9 – Brahier	
Tuesday	10-27	Assessment		Student Interview: Part II
Wednesday	10-28	NO CLASS – Fall Break		
Tuesday	11-3	Assessment	Chapter 10 – Brahier	
Wednesday	11-4	Teaching Specific Mathematics Content: Algebra	Chapter 8 – Brahier	
Tuesday	11-10	Teaching Specific Mathematics Content: Algebra		Content Analysis Presentation and Paper**
Wednesday	11-11	Teaching Specific Mathematics Content: Geometry		
Tuesday	11-17	Teaching Specific Mathematics Content: Geometry		History of Mathematics Project
Wednesday	11-18	Teaching Specific Mathematics Content: Data Analysis Probability		
Tuesday	11-24	Teaching Specific Mathematics Content: Pre-Calculus and Calculus		
Wednesday	11-25	Equity	Chapter 11 - Brahier	
Tuesday	12-1	Equity		
Wednesday	12-2	Portfolio		
Tuesday	12-8	Portfolio		Unit Plan
Wednesday	12-9	Master's Project		Clinical Faculty Evaluation
Wednesday	12-16	FINAL EXAM		Take-home final due

*NOTE: For your Problem Solving grade, you must submit your solution by midnight each Monday.

**NOTE: This date is only tentative. The actual date for the Content Analysis Presentation will depend upon the content topic that your group selects.