

**EMAT 4500/6500**  
**Connections in Secondary Mathematics**  
**Spring 2008**

**Instructors**

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**Office hours**

Tuesdays, 11 AM – 12 PM or by appointment; please email or call.

If you have a question or concern about the course or an assignment, please do not hesitate to contact us. You are welcome to stop by 105 Aderhold (the main Math Ed office) to see if we are available; however, if you call or email ahead of time we can work to coordinate our schedules with yours.

**Course description**

This course is about connections within mathematics itself and between mathematics and contexts outside it. The principal focus is on a deeper analysis of problems and concepts from high school mathematics. The goals of this course include deepening our own understanding of mathematical ideas and developing an understanding of the kinds of mathematical thinking we would like to see in high school students.

**Course structure**

The course will consist of assignments, a midterm exam, and a final project. The assignments will include problem sets, research assignments, and reflective writing assignments that will allow us to explore several big ideas from high school mathematics. The final project is an exploration of a mathematical topic of your choosing.

**Course topics** (subject to change)

We will focus on mathematical processes within the contexts below:

- Real and complex numbers
- Number system structures
- Trigonometry
- Axiomatics and Euclidean geometry

**Required textbooks**

Usiskin, Z., Peressini, A., Marchisotto, E. A., & Stanley, D. (2003). *Mathematics for high school teachers: An advanced perspective*. Upper Saddle River, NJ: Pearson Education.

National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics*. Reston, VA: Author. (This is available from NCTM either online or in printed form. If you are an NCTM member, online access is free.)

**Expectations**

All students are expected to attend every class session and to participate fully in class activities. Much of the time in class will be spent working individually or with others on mathematical problems or activities. Absence from class without prior permission from the instructor will result in a grade penalty. All assignments are due at the beginning of class on the stated due date;

a late assignment will receive a full letter-grade deduction for each day it is late. All assignments are to be completed in a professional manner. This includes proof-reading your assignments to ensure that you are communicating your ideas clearly.

### **Problem sets**

Part of the goal of this course is to learn to construct and recognize a good mathematical explanation. Solutions should be written in such a way that a classmate could understand your reasoning. That is, an answer alone will receive little credit, and an answer involving only symbols will be considered incomplete. Students are encouraged to collaborate when solving homework problems. However, each student is expected to write his or her solutions independently. Be careful to allow yourself enough time to think through the problem on your own as you write your solutions. Solutions may be typed or clearly hand written; unreadable work will not be graded, so if in doubt, use a computer.

### **Research and reflective assignments**

All research and reflective assignments must be typed, double-spaced, in 12-pt font. These should be completed professionally, using appropriate software to insert mathematical symbols, equations, and graphs. As you complete these assignments, take note of the resources you are using, and give credit to these authors. Part of teaching is learning to adapt ideas and materials that are developed by someone else, and you should always cite the source of an idea, problem, or activity. Unless otherwise stated, you should work individually on these assignments.

### **Weekly reactions**

Approximately once each week (usually on Thursdays), you will be asked to write a short reaction to course activities and submit it via WebCT. We will post a question for you to answer or ask you to respond to a particular statement or activity. In addition to answering the questions, you should feel free to provide feedback about what you are learning or how the course could be improved. The completion of these reactions will be part of your class participation grade.

### **Course materials**

#### **Graphing calculator**

All students should bring a graphing calculator (such as a TI-83) to every class session.

#### **Textbook**

All students should plan to bring a copy of the Usiskin et. al. textbook to class on a regular basis.

#### **Notebook**

You may find it helpful to keep course materials in a notebook and bring this to class on a regular basis. We will often refer back to previously considered problems or activities as we work on other problems.

### **Final project**

The final project is an opportunity for you, in a group of three to four people, to explore a mathematical topic on your own in a way that is similar to how we explore mathematical ideas in class. More detail will be given as the course progresses.

## UGA resources

You will be asked to write about both mathematics and teaching in this course. You may find that you engage in more writing in this course than in many of your other courses. You are expected to complete this writing in a professional manner, using standard formats. In particular, you are expected to cite your sources using APA style. An online guide to APA style is available from the UGA library website (<http://www.libs.uga.edu/ref/citation.html>). Additional assistance with writing is available from the UGA Writing Center (see <http://www.english.uga.edu/writingcenter/home.html>).

## Memberships

We suggest that you join the National Council of Teachers of Mathematics (NCTM) and subscribe to the *Mathematics Teacher*. Student membership is \$38, and you may join online at <http://www.nctm.org>. It is also a good idea to join the Georgia Council of Teachers of Mathematics (GCTM). See <http://www.gctm.org>. Student membership is free for juniors and seniors. We expect that you are already a member of University of Georgia's Mathematics Education Student Association (MESA). Membership dues are \$2 for undergraduates and \$5 for graduate students. MESA is an opportunity to interact with all members of the Department of Mathematics and Science Education on a more informal basis. See <http://www.coe.uga.edu/mesa>.

**Academic Honesty** (see also <http://www.uga.edu/honesty/>)

*All students are responsible for knowing the University's policy on academic honesty. All academic work submitted in this course must be your own unless you have received my permission to collaborate and have properly acknowledged receiving assistance. It is my responsibility to uphold the University's academic honesty policy and report my belief of dishonesty to the Office of the Vice President for Instruction.*

## Grading

Most assignments will be graded according to the following scale (which will be adapted according to the number of points for each assignment). This rubric may also be used for individual parts of an assignment (such as individual problems in a problem set).

- A Exemplary work demonstrating solid understanding and insight
- B Satisfactory work demonstrating understanding
- C Almost satisfactory work with insufficient detail or lacking a required element
- D Deficient work demonstrating little grasp of key ideas or lacking more than one required element
- F Failing work

The course grade will be calculated using the following weights.

Graded assignments	30%
Midterm exam	20%
Class participation	25%
Final project	25%

*This syllabus was adapted from syllabi developed by J. Kilpatrick in Spring 2003 and B. Findell in Spring 2007.*