

## **EMAT 3500**

### **Exploring Concepts (with Technology) in Secondary School Mathematics**

#### **Prerequisites for EMAT 3500 & 4680**

MATH 2200, 2210 & 3000 and one of the following:  
MATH 3200, 2500 or 2700.

If you have not studied differential and integral calculus, and linear algebra you will not be able to enroll in these courses.

#### **Course Overview**

**Students in EMAT 3500 will have the opportunity to:**

- engage in mathematical, epistemological, curricular, and pedagogical investigations (and read and discuss relevant research and literature);
- address and investigate basic concepts in the secondary mathematics curriculum, focusing on algebraic concepts: particularly functions, statistics, and mathematical modeling;
- become familiar with the NCTM *Principles & Standards* and relate secondary mathematics concepts to the *Standards*;
- become familiar with the *Georgia Performance Standards* (GPS) for mathematics in grades 6-12 and relate the activities in this course to these standards;
- reflect on becoming a mathematics teacher;
- communicate and reason mathematically, solve problems, investigate different representations, and make mathematical connections as discussed in the NCTM *Principles & Standards*;

- become familiar with and operational with using technological tools in doing mathematics;
  - use general tools such as word processing, paint and draw programs, spreadsheets, and the Internet to facilitate mathematical investigations and to communicate about mathematical investigations;
  - use application software to solve mathematical problems;
  - use application software to create mathematical demonstrations;
  - use application software to construct new ideas of mathematics for yourself;
  - explore mathematics using a variety of technologies including graphing calculators, computer software, and textbooks;
  - communicate mathematical ideas using various technological tools.
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## **Required Textbooks and Resources**

### **Texts**

Title: Principles and Standards for School Mathematics (with CD-ROM). Also available via the NCTM web site ([click here for link](#)).

Authors: National Council of Teachers of Mathematics

Publisher: NCTM

Title: Transforming Mathematics with *The Geometer's Sketchpad*

Authors: John Olive & Nicholas Oppong

Publisher: Not yet published; available from the instructor or as a course packet from Bel-Jean Copy and Printing, 163 E. Broad Street, Athens. (\$7.40)

## **Software and Technology**

### **1. Access to the Internet and Email**

### **2. [Geometers' Sketchpad Version 4, Student Edition](#)**

The student edition includes:

- The Geometer's Sketchpad software CD-ROM - works on both Windows and Macintosh computers.
- The Geometer's Sketchpad Learning Guide - in addition to a comprehensive reference section, includes 11 guided tours designed to introduce students to the program using fun, interesting and mathematically relevant activities.
- 101 Project Ideas for The Geometer's Sketchpad - a great source of ideas for Sketchpad projects at all levels, ranging from simple perspective drawings to complex animated calculus sketches.

### **3. [Fathom 2: Dynamic Statistics Software, Student Edition](#)**

**NOTE: Items 2 and 3 are available in a bundle from the UGA Bookstore under EMAT 3500**

### **4. TI-83 Plus or 84 Graphing Calculator (or equivalent)**

You should be able to purchase this calculator for under \$100.00

Price compare at Best Buy, K-mart, Staples, Sam's, etc...

For more information go to: <http://education.ti.com/>

**5. (Optional)** Graphing Calculator 3.2 for Mac or Windows  
Order on-line from

<http://www.pacifict.com/StudentDiscount.html>

The student discount price is \$40. Make sure to order the correct version for your operating system (Mac or Windows).

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## **Assignments**

Weekly assignments will be provided. They will be discussed in class and due dates will be provided. **One point will be deducted for each day that an assignment is turned in late** (maximum point totals for each assignment are indicated on the class web-page).

Weekly assignments will consist of a variety of readings, writings, and mathematical & technological investigations.

The class will use fully ethernet networked computers in Aderhold Hall. All assignments will be given via the class web-page and turned in via LiveText. We will have access to and learn to use various network tools.

## **Portfolios**

Each student will be required to create an electronic portfolio of work completed for this course using the LiveText internet system. This electronic portfolio will

include selected readings, assignments, reflections and your final project. This portfolio will be reviewed and graded at the end of the semester.

### Time on computers

You can not expect to accomplish what you should from this course without time on the computers that is in addition to the time we have in class. The usual expectation of 2 hours study outside of class for every hour in class is probably a minimum. There are several Macintosh laboratories available in this building and across campus.

We are scheduled to hold this class in Room 112 with Macintosh iBook G4 computers. The Mathematics Education Macintosh Computer Laboratory in room 111/113 is equipped with the latest G5 Macintosh computers and can be used when a class is not scheduled in the lab. There are some additional PowerPC Macintosh computers in Room 231, Room 615, and in the EMAT Library.

In general, the application programs we will use in this class will run on any of the Macintosh computers except the oldest machines. There are distinctions such as operating systems and hard disk drives that have to be accounted for. If you have your own Mac, or access to one, I will help you get set up to run these programs on it (if it is possible).

Most Macs today run with operating system 9.0 or higher. In general, as operating systems have improved over time,

most people move to the newest system. Our machines in Room 111/113 use System 10.4 (Mac OS X).

Most of our software is also available for Windows machines. The functionality of some other Windows software is similar to what we use. Certainly the Windows environment could be used for implementing this course. Students can work at home on a Windows computer and transport to these Macintosh machines via removable media (e.g. CD or USB disks) or the network (e.g. via email attachments).

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### **Attendance Policy**

As part of being a professional teacher, regular participation in all course activities is required. On-time completion of assignments and arrival to class is expected. If at all possible, please notify me before missing a class meeting. All absences will be documented and attendance records will be used in calculating your final grade. Class attendance and participation will count a total of 30 points. Tardies will receive only half a point for each late attendance. Unexcused absentees will receive zero points. Excused absentees will receive half a point. Excused medical absences require documentation (a note) from your doctor or the Student Health Center. Other unavoidable absences must be approved by me BEFORE the time you will be absent. I may require written verification of the conflict.

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## **Grades and Requirements**

It is my intention to base grades on performance in meeting the requirements of the course. This performance includes the following:

Class Attendance and Participation.....10% (30 points)

Assignments .....40% (120 points)

Midterm Exam .....20% (60 points)

Portfolio.....10% (30 points)

Final Exam Project.....20% (60 points)

Percentages will be based on a 300 point total for the course.