

EMAT 4700/6700

Advanced Explorations With Technology In Mathematics Instruction Maymester 2016

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Class Time: Monday-Friday: 9:00 – 11:45 AM

Room: 102 Aderhold Hall

Class Website: <http://ugaemat4700may2016.weebly.com/>

OFFICE HOURS

Office hours are by appointment only. If you have a question or concern about the course or an assignment, please do not hesitate to contact me via email. If you would like to meet in person, please email me so I can coordinate a time that works with my schedules and yours.

COURSE OVERVIEW

The purpose of this class is to develop our knowledge, abilities and skill in how to appropriately, effectively, and efficiently select and use technology in mathematics instruction, with an emphasis on the organization and design of technological tools for secondary mathematics courses.

OBJECTIVES

- To use application software and technological tools to solve mathematical problems, engage in mathematical investigations, create mathematical demonstrations, and construct new ideas of mathematics for yourself.
- To analyze the affordances and limitations of software applications and its connections to the mathematics and how to take this into account when planning activities and lessons.
- To design mathematical activities and lessons that capitalize on the affordances of technology.
- To communicate mathematical ideas that arise from computer investigations using word processing, computer applications, and web technologies.
- To examine pedagogies and instructional methods specifically designed to be capitalize on the affordances of technology and how these pedagogies and methods can be used to promote student learning in the secondary mathematics classroom.
- To become familiar with recent issues in the literature regarding the use of technology in mathematics education.

TEXT

There is not an official text for the course. Course readings will be posted in eLC.

Additional Resources

- You should have access to the NCTM *Principles and Standards for School Mathematics* and the *CCGPS*.

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- You should be prepared to use Internet and library resources on a regular basis.
- Additional readings will also be required.
- Lynda.com is an online library of courses taught by recognized industry experts and is a part of UGA's online training program. Go to: http://eits.uga.edu/learning_and_training/lynda

COURSE EXPECTATIONS

Professional Behavior. As current and future teachers, professionalism is critically important. Professionalism includes arriving on time and prepared for class, class participation, your response to constructive feedback in the classroom and on written work, and exhibiting a professional demeanor (language, attitude) toward others. In addition, professionalism includes being on-task and attentive during class, which means not working on assignments for other classes, working crossword puzzles or sudoku, reading the *Red & Black*, or making inappropriate use of the internet (e.g., email, Facebook) during class.

Attendance. You are expected to attend all classes and to arrive on time. You are responsible for all announcements made in class even if you are not there. Absences and tardiness will affect your final grade. Two points will be deducted from your point total for every absence and one point will be deducted for every tardy or time you leave early. Any exceptions to attendance and punctuality should be discussed with me *in advance*. If you are taking the class online, all assignments must be completed in a timely fashion.

Class Participation. You are expected to participate in class activities and discussions. Class participation includes both your contributions and your reactions to the contributions of others. Active participation is a critical condition for learning anything more deeply. The pedagogy being advocated and modeled through our course is the belief that students must commit to, and be involved actively in, the problematic situations posed. Therefore, most classes will be spent on group discussions, activities,

Assigned Readings. You are expected to read all assigned readings **before** class. We will spend several classes discussing our readings. You should therefore bring to class your questions, doubts, comments, or ideas that come up during your readings. More specifically, for every reading you should write one (1) question and two (2) ideas to guide our class discussion. It is through sharing that we increase our understanding of the concepts discussed in class. Readings will be available on eLearning Commons. In class, I expect you to have access to the manuscript whether it is a hard copy or a digital copy. If you plan to use a digital copy, I expect you to access it on your own device and not the computers in the lab.

Use of Cell Phones. As a general rule, all cell phones should be silenced during class. Talking on the phone or texting during class should not occur. If it is necessary (due to an emergency situation) for you to leave your phone on during class, please speak with me prior to class and then leave the room to answer your phone.

University Policies. University policies regarding course withdrawal and the assignment of incomplete grades will be followed.

ASSIGNMENTS

I will try to make the purpose of each assignment clear. If you have questions about the purpose of the assignment or what is expected of you, please ask. All assignments are due via eLC on the due date listed in the syllabus. **Late assignments will be assessed a penalty of 10% per day of the grade unless there are extenuating circumstances that are discussed with us in advance.**

Assignment Overview

Assignment	Percent toward final grade	Due Date
Reading Quizzes, Article Critiques, Reflections, other Daily Assignments	30%	Various
Technology Review	20%	Various
Course Project	50%	June 7
Total:	100%	

Written assignments and presentations will be assessed on the quality of your writing and/or presentation as well as your interpretation and understanding of course content. Each assignment will be graded on a 100 point scale:

A: 94-100	C+: 77-79
A-: 90-93	C: 74-76
B+: 87-89	C-: 70-73
B: 84-86	D: 60-69
B-: 80-83	F: 59 and below

Final grades will be based on the overall average of all assignments and will be assigned using +/- grades per university policy.

Daily Assignments & Reading Quizzes

At times, the instructor will give assignments related to specific class activities. These assignments will be announced in class. The students will need to complete the assignments by the given deadline by either submitting them via eLC or bringing them to class.

Finally, reading quizzes will be given throughout the semester on the assigned readings. These quizzes may be unannounced and are planned for 15-20 minutes. The quizzes will deal with the big ideas from the readings and discussions from the most recent sessions. The quizzes will be administered via eLC.

Reflections

In addition to daily participation you will be asked to write reflections on the readings and/or class activities. These reflections will be due each Wednesday and are to be submitted via eLC. You will type a (at least) 2-3 page reflection on any one (or two) event(s) (this may include readings, in-class activities, assignments, etc.) in the class meetings thus far. Reflections are designed for you to relate what you are learning in class to your own practice or experience. Choose one aspect that was of interest to you, and discuss it in depth. In grading your reflection paper we will be looking for:

- a well-developed reason on why you chose the event to reflect upon
- thoroughness in regards to your thinking and understanding of the event(s)
- how you may use it to benefit your future teaching and current professional learning
- coherence and the quality of writing (this includes proper citations)

Article Critiques (EMAT 6700 students only)

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Graduate Students will be required to read three articles in mathematics education research journals that focus on the teaching and learning of mathematics using technology (the instructor may provide the articles). For each article, write a 3-page, double-spaced summary, critique, and reflection on how this article may benefit your future teaching and research. The critiques are due by 11:59 PM on the following dates: May 23, May 31, and June 6.

Technology Review Assignment and Presentation

Technology is pervasive. There are many wonderful tools, programs, and applets available to classroom teachers that assist in the teaching and learning of mathematics. Each student will select a technology tool, present the tool by engaging the class in an exploration using it, and create a web page that reviews and critiques the tool. More details will be given in a separate document.

Course Project

The purpose of this assignment is to create a sequence of activities that employ technology in meaningful ways. The final project is intended to allow you, individually, in pairs, or in trios, to develop a complete teaching resource package for a unit to support implementation of a selected topic from the Common Core Standards. The package should provide student materials, detailed guidelines related to all activities of student and teacher, including assessment and evaluation, and justifications for your selections. Reflections from each member of the group should discuss connections, applications and impacts of your development experiences into future teaching practices. Your project must make effective use of appropriate technologies and be accessible through the Internet. The rationale for the choice of technologies must be clearly stated in the report. More details on the Final Project, including rubrics for each section, will be given in a separate document.

WEBSITE

Both the tech review assignment and the course project will require you to complete assignments by creating a website. Websites are a wonderful way to communicate with parents and students about the events in your classroom and additional resources to supplement your instruction and student learning. Years ago, you had to know HTML in order to create a website. That is no longer the case. There are many wonderful companies that will allow you to build your own website (e.g. Google Sites, Wix, Wikispaces, Moonfruit). In this class, we will be using Weebly. On the first day of class, you will create your own Weebly website to upload the assignments above along with other course materials we will create in class. Your Weebly will be linked to the Class Weebly site so your classmates can view your work.

NOTE ON WRITTEN REQUIREMENTS

All written work for this class should be double-spaced, with 1-inch margins all around and 12 point font. All written assignments will be submitted via eLC unless otherwise specified by the instructor. High quality written work will take advantage of the theoretical and practical ideas set forth in your reading assignments and discussed in class. In particular, you should draw on the *Principles and Standards for School Mathematics* whenever possible. Proper citation, in the format and style of the American Psychological Association (APA), of all reference sources is required for every assignment (for information about APA guidelines visit the UGA library website: <http://www.libs.uga.edu/ref/citation.html>). Please utilize the resources available to you in order to ensure the quality of the work you submit. For instance, have a classmate critique your assignment or visit the campus writing center.

UNIVERSITY POLICIES

Honor Code and Academic Honesty Policy

University policies regarding course withdrawal and the assignment of incomplete grades will be followed. It is your responsibility to be familiar with these policies. As a University of Georgia student, you have agreed to abide by the University's academic honesty policy, "A Culture of Honesty," and the Student Honor Code. All academic work must meet the standards described in "A Culture of Honesty" found at: www.uga.edu/honesty.

Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor. Students with disabilities who require accommodations in order to participate in course activities or meet course requirements should contact Dr. Smith during regular office hours or by appointment.

Americans with Disabilities Act

The University of Georgia seeks to fully comply with the Americans with Disabilities Act (ADA). Students requesting accommodations based on a covered disability must go to the Disability Resource Center in 205 Clark Howell Hall to arrange the necessary accommodations. They can be reached at 706-542-7721.

Tentative Plan (subject to revision)

The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.

Date	Topic	What's Due?
Week 1 - Geometry		
M 5/16	Syllabus, Introductions, How does technology change the way we think about mathematics, Dynamic Environments Tech: Geogebra	• Class 01 Responses Due
T 5/17	Evaluating Technology Tech: Online Sketches	
W 5/18	Dynamic Geometry – Comparing environments Tech: GSP and Geogebra	• Technology Evaluation Due
R 5/19	Online sketches – Pre Constructed vs Student Constructed Tech: Geogebra Technology Review Presentation	
F 5/20	Work on Project and Online Sketch Technology Review Presentation	• Reflection 1 Due • Course Project Description Due
Week 2 – Number and Algebra		
M 5/23	Calculators & Talent Show Tech: GC, Broken Calculator, Excel Technology Review Presentation	• Article Critique 1 Due (6700 Students only)
T 5/24	Parameters Exploration Tech: GSP, Fathom, GC, Excel, Shodor, Desmos, Geogebra Technology Review Presentation	
W 5/25	Modeling Tech: GC, CBR Technology Review Presentation	• Course Project Intermediate Reflection Due
R 5/26	Geometry And Algebra connections - Dynagraphs Teaching Mathematics and Social Media – Guest Instructor Tech: Geogebra Technology Review Presentation	• Withdraw Deadline
F 5/27	Work on Project Technology Review Presentation	• Reflection 2 Due
Week 3 – Connected Classroom		
M 5/30	HOLIDAY – NO CLASS	
T 5/31	Flipped Classroom Tech: Cameras, Screen-Capture Technology Review Presentation	• Article Critique 2 Due (6700 Students only)
W 6/1	Flipped Classroom & Mobile Technologies Tech: QR Readers, Apps Technology Review Presentation	• Course Project Intermediate Reflection Due
R 6/2	Connected Classroom Tech: TI-Connect Technology Review Presentation	
F 6/3	Work on Project Technology Review Presentation	• Reflection 3 Due
Week 4 – Final Project		
M 6/6	Work on Project Technology Review Presentation	• Article Critique 3 Due (6700 Students only)
T 6/7	FINAL EXAM – Final Course Project Presentations	• Course Project Due • Course Project Reflection Due