

EMAT 3410–Mathematics Teaching & Curriculum PreK-5

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Overview: This course will concentrate on problem solving, data analysis, money, fractions, decimals, geometry, measurement and time. We will also work on translating the ideas about children’s mathematical thinking from EMAT 3400 to small group and whole class settings.

Objectives: The objectives of this class are for you to:

- Understand how children think about problem solving, data analysis, money, fractions, decimals, geometry, measurement and time
- Strengthen your own mathematics background in the areas of problem solving, data analysis, money, fractions, decimals, geometry, measurement and time
- Learn to make decisions about content selection and modification of instructional activities based on theories of mathematical learning and current educational reform efforts;
- Use knowledge of how children learn mathematics to plan appropriate instruction for small and large groups.
- Develop critical view of mathematics curriculum, textbooks, and other instructional materials
- Develop a repertoire of alternative (differential) instruction and assessment strategies to meet the intellectual and cultural needs of diverse students.
- Examine the nature of schooling, including teaching, grouping, testing, and policy issues, and its impact on the mathematics education of diverse students.

Required Course Materials:

1. Course Text: *About Teaching Mathematics: A K-8 Resource* 2nd Edition by Marilyn Burns
Publisher: Math Solutions Publications; 2nd edition (August 2000)
Paperback version

ISBN-10: 094135525X
ISBN-13: 978-0941355254

2. You are responsible for going to the Georgia Department of Education web site (<http://www.georgiastandards.org/math.asp>) and printing a complete copy of the Georgia Performance Standards for grades Kindergarten through 5 and the Executive Summary (I will also make a hard copy available in case you have trouble receiving the email attachment). You are responsible for getting your own printed copy of this document.

3. Throughout the course I will send you email attachments (or provide photocopies) of other articles or lesson plans that we will use in class. Therefore you will need a **LARGE** three ring binder to hold these handouts.

Attendance: Attendance and participation are essential in this class, both for you to learn and so that others may benefit from your input. Attendance is expected because most of class time will be spent on group discussions and activities. The ideas and concepts presented cannot easily be transmitted through class notes. You are responsible for all announcements made in class even if you are not there. It is important that you arrive promptly. Absences and tardiness will affect your professionalism grade (-10 points for unexcused absence; -2 for excused). Any exceptions to attendance and punctuality should be discussed with me *in advance*.

Assignments: It is expected that you will do your assignments on a word processor unless I indicate that an assignment may be handwritten. Any other exceptions must be cleared with me in advance. It is important to note the following...

*Assignments that are not typed will be returned without a grade.

*Label each assignment with your last name and the assignment number.

For example, Brooks-Glyph#1

*I would prefer that you send me your assignments as an e-mail attachment.

The requirements for all major assignments are detailed on the following pages. If you have questions about the purpose of the assignment or what is expected of you, please ask.

Late assignments will be assessed a penalty of 10% of the grade per day unless there are extenuating circumstances that are discussed with me *in advance*. You are expected to demonstrate **correct use of the English language with regard to grammar, punctuation, and spelling. I do grade on technical writing skills as well as content.** Therefore...

Please proofread your work before turning it in to me!

Written work will be assessed on the quality of your writing as well as your interpretation and understanding of course content.

Course grades: Grades will be based on total points earned out of 300.

Assignments (see following pages)	250 points
*Professionalism	50 points
TOTAL	300 points

**A = 281-300pts A- = 270-280 B+ = 260-269 B = 250-259 B- = 240-249 C+ = 230-239
C = 220-229 C- = 210-219 D+ = 200-209 D= 190-199 D- = 180-189 F < 180pts**

**Your grade for Professionalism will be based on arriving on time and being prepared for class (having read the assigned lessons), class participation (which includes both your contributions and your reactions to the contributions of others), your response to constructive feedback in the classroom and on written work, and exhibiting a professional demeanor (language, attitude) toward others.*

University policies: All university policies with regard to withdrawals, academic honesty, etc. will be strictly followed. It is your responsibility to be familiar with these policies.

Tentative Schedule

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

Date	Topic	Assignment Due
Jan. 12th	Glyph	
Jan. 14th	*Data Analysis	Glyph #1 Due
Jan. 19th	Holiday	
Jan. 21st	DOE Website/frameworks	Data Analysis Due
Jan. 26th	Money	
Jan. 28th	Money	
Feb. 2nd	*Time	
Feb. 4th	*Time	
Feb. 9th	Measurement	
Feb. 11th	Measurement	
Feb. 16th	*Measurement	Measurement Plan Due
Feb. 18th	Geometry	
Feb. 23rd	*Geometry	Glyph #2 due
Feb. 25th	Geometry	
March 2nd	Geometry	
March 4th	Work Day	**Measurement Reflection due on March 6th*
March 16th	Work Day	
March 18th	Geometry Presentations	Geometry Assign Due
March 23rd	Geometry Presentations	
March 25th	Geometry Presentations	
March 30th	*Fractions	
April 1st	*Fractions	
April 6th	Fractions	Assessment Assign. Due
April 8th	Fractions	Teach Geometry activities
April 13th	*Graphing	Glyph #3 due
April 15th	*Graphing	
April 20th	Problem Solving	Teacher Interview Due
April 22nd	Assessment	
April 27th	Assessment	
April 29th	Geometry Activity Feedback	
April 30th	Open	**Final Paper due May 4th

*** Denotes dates we will share in our team teaching pods (this will be explained in class).**

****Denotes an assignment due on a day we DO NOT have class!**

Assignment Due Dates Overview

Assignment	Points	Date Due
1. Glyph #1	10	January 14th
2. Video Analysis	25	January 21st
3. Measurement Lesson Plan	25	February 16 th
4. Glyph #2	10	February 23rd
5. Measurement lesson plan reflection	10	March 6 th
6. Geometry Presentation	40	March 18th
7. Student Work Assessment	20	April 6 th
8. Glyph #3	10	April 13 th
9. Teacher Interview	25	April 20th
10. Final Paper	75	May 4th
*Professionalism	50	All semester

FIELD EXPERIENCE

During your field experience I hope that you will take advantage of every opportunity you have to observe mathematics being taught, to teach lessons yourself, to run math centers, and to assist individual children with mathematics. **There are six assignments related to your field experience that will be due at various times throughout the semester. These assignments each have a * beside them. They include; Glyph #2, Measurement Lesson Plan Reflection, Student Work Assessment, Glyph #3, Teacher Interview, and teaching your Geometry activities. The requirements are detailed below. If you have questions about the purpose of the assignment or what is expected of you, please ask.**

Assignment Descriptions

Glyph #1

Read the article distributed in class that further defines a glyph. Then design a glyph that you could use with a class of students (any grade level, any content area, any topic). Include a brief explanation of how you would use this glyph with students **and** what you believe to be the benefits of conducting this type of activity (meaning glyphs).

***Please be sure to provide an example of what you expect the glyph to look like!**

*Glyph #2

In order to get to know your students better, create a glyph and use it with your first assigned classroom. Provide a copy of the glyph, the descriptors for the glyph, as well as a brief summary of what happened when you conducted this activity and what you learned about your students.

***Glyph #3**

Same requirements as Glyph #2, but conducted with your second set of students.

Data Analysis

For this assignment, you will write a paper about the classroom discourse that occurs in the *Questioning Data* videotape that **we will watch in class**. You may complete this assignment individually **or** in groups of 2, 3 or 4 people. If you choose to work with a group, you should turn in one paper with all of your names on it, and you will all receive the same grade for the assignment.

In your paper, you should **describe and evaluate the manner in which the lesson meets the standards for teaching identified by the National Council of Teachers of Mathematics**. I will distribute a copy of these standards in class. In addition, you should describe and evaluate the extent to which it meets the Georgia Performance Standards in Data Analysis for first grade. Lastly, please explain why you think this is or is not an example of an equitable classroom.

***Teacher Interview**

Talk with your teacher about a mathematics topic that he/she believes to be a difficult concept for students to grasp, or a topic that the teacher has difficulty with or does not like teaching. The difficulty can be either in teaching the topic or it can be in the student's understandings of the topic. Have the teacher elaborate on what the specific difficulties are with this topic and why they feel these difficulties exist.

You will need to provide a list of the specific questions (come up with at least 5) that you ask your teacher along with a brief summary that includes the following:

What your teacher said, your own opinions about what the teacher has said, and why you agree or disagree with what they have addressed.

When appropriate site examples from texts or articles you have read to support your opinions.

Additionally, include a lesson plan that has 3-5 activities that address the difficulties mentioned by your teacher. Make sure to give your teacher a copy of the lesson plan/activities that you put together. You may use ideas we have discussed in class; suggestions that are in the Marilyn Burns text; or something from one of the many educational websites available. Two extremely good sources are <http://illuminations.nctm.org/> and www.glc.k12.ga.us/gcc/

****For a bonus assignment (you can earn up to +10 extra credit points for this), conduct one of these activities and write a brief summary reflecting on the teaching experience.***

*Measurement

I will read the book *Spaghetti and Meatballs for All* by Marilyn Burns **in class**. Together we will write a plan for a measurement lesson that includes this book. Then, working with your teaching partner, you have two tasks:

1) **Lesson Plan** - With your teaching partner you will select a children's book that addresses a **measurement topic taught in the grade level you are assigned** and write a lesson plan describing how you will use the book. The plan needs to be written in such a way that it can be used with a class of heterogeneously grouped students. It should also be thorough enough that a substitute teacher could pick it up and implement it successfully. You should use the lesson plan we write for *Spaghetti and Meatballs for All* as a guide. Instead of writing objectives for your lesson plan please include the following:

- What should students *know* at the end of this lesson? (e.g., facts, vocabulary)
- What should students *understand* at the end of this lesson? (e.g., concepts, ideas)
- What should students *be able to do* at the end of this lesson? (e.g., skills)

2) **Reflection of Teaching** - Implement this lesson plan with your students in the field. After teaching the lesson, you will write a one to two page reflection discussing what happened, examples of student and teacher discourse, and any changes that you made or will make to the lesson the next time you teach it.

Your measurement lesson plan will be due February 16th. However, you have until March 6th to turn in your reflection of the teaching experience.

*Student Work Assessment

Review student work from any particular mathematics lesson or activity. Provide copies of one piece of student work that shows a high level of understanding, one piece that shows a moderate level of understanding and one piece that shows a low level of understanding. Explain how you selected each piece of student work and why you classified them as you did. (Remove students' names from the work before turning it in.) **You should consult with your mentor teacher while assessing the student work samples. When you write up your assessment of the students' work it is okay to disagree with your mentor teacher's opinion as long as you provide evidence that supports your line of thinking.**

Geometry

THIS IS A GROUP/TEAM WORK ASSIGNMENT THAT WILL INCLUDE A GROUP PRESENTATION

There are five parts to this assignment.

1) **Lesson Plan/Activities**

The teams will be decided in class. Once the grade level teams have been established then each team will select three to five activities (as needed) that address all of the geometry standards for the assigned grade level. **Describe each activity in narrative form and in enough detail that a substitute teacher could conduct the activities successfully.** If you adapt any activities from other sources (e.g., books, the web, articles), provide a citation for the original source. **Each group will need to provide a copy of the activities/lesson plans for all students in our class.**

2) The Geometry Group Presentation

Prepare a presentation in which your group will lead **our EMAT class** through **all** of the activities in your geometry lesson plan. Your presentation should last between 20-30 minutes. **Everyone** in your group must participate in the presentation. You will have access to whatever materials and manipulatives we have in the math closet. Be creative and have fun! ☺

REMEMBER...

*Each group will need to either send an email attachment or make copies of **all of the activities/lesson plans** you compile so they can be **distributed to all of the students in our class**.*

3) *Implementation

You will teach at least two of the geometry activities associated with your grade level to your **second classroom of students** (these will **not** be the same geometry activities that you chose for your group Lesson Plan/Activities assignment). This assignment is designed this way to give you experience teaching from someone else's plans **and** to understand the importance of being thorough when writing plans for someone else to follow!

4) Geometry Activity Constructive Feedback

After teaching the lessons, you need to write a brief summary that you can share in class in regards to what happened when you implemented the lessons, what changes you recommend making, and why you think these changes will improve the lesson. Your feedback will be directed to the group of students that wrote the lesson plans so they are able to make any necessary changes to the activities. **It is extremely important that your reflection and feedback be constructive because you will use the feedback you receive when writing your final paper.**

5) Final Paper (see below)

FINAL REFLECTION PAPER

You will be able to begin working on this paper **after** March 25th. It will include 3 sections..

1. The written summary you shared with peers in regards to what happened when you implemented the geometry lessons, what changes you recommended, and why you think these changes will improve the lesson (see #4 above).
2. A description of the changes that were recommended to you by the folks who taught the geometry activities **your team** planned and why you think these changes will **OR** will not improve the lesson.
3. A mindful reflection about the benefits of constructive feedback, how we should deliver this kind of feedback to our peers, how we should react when we receive constructive feedback from others, what we should do with the feedback received, how to create opportunities to critique yourself, and why it is necessary to make all of this an ongoing aspect of your teaching.