

## **EMAT 3400 - Children's Mathematical Learning**

Instructor: Allyson Hallman

Office: Aderhold 105

Phones: 706.542.4548 (office)

e-mail:

Assistants: Hyeonmi Lee, Soo Jin Lee

Office: Aderhold 504, LPSL (6<sup>th</sup> floor Aderhold)

Phone: 706.542.4548 (office)

email:

### **Overview**

You will have two mathematics education courses during the Early Childhood program. During this semester, EMAT 3400 will consist of a field experience at Barrow Elementary School one day per week for eight weeks and class at UGA the remainder of the time. At Barrow Elementary School you will work with one child on mathematics concepts and skills in the context of problem solving activities. This course will concentrate on topics of addition, subtraction, multiplication, and division of whole numbers, fractions, and decimals. Connections to algebra and percent will also be discussed. In the spring, EMAT 3410 will concentrate on geometry, measurement, probability, data analysis, and algebra.

### **Course Materials**

Chapin, S. H., O'Connor, C., & Anderson, N. C. (2003). *Classroom discussions: Using math talk to help students learn*. Sausalito, CA: Math Solutions Publications.

(East Side Campus bookstore has one copy and 12 on order. You may be able to get a better and faster deal through Amazon.)

Selected readings available on webct course page.

### **Objectives**

The objectives of this class are for you to:

1. Widen your repertoire of communication strategies and skills by
  - learning to listen to and learn from children.
  - learning to communicate mathematically with a child.
  - planning and carrying out appropriate activities for a child.
  - becoming aware of children's mathematical thinking, how it differs from adult thinking, and how it might impact your teaching.
  
2. Experience teaching/learning strategies that align with current reform efforts by
  - learning to create an environment that is safe for students to share and justify their thinking, ask questions, make conjectures, and take risks.
  - learning to guide individual, small-group and whole-class work.
  - coming to view mathematics as a sense-making activity.
  - assessing students' mathematical thinking and their understanding of mathematics concepts and procedures, and planning instruction based on those understandings.
  - respecting students' thinking, even when you do not understand it.
  - utilizing methods that convey understanding of concepts and facts, not just rote memorization.
  
3. Understand interconnections among content areas through thematic, interdisciplinary

instruction by

- coming to see mathematics in all aspects of our daily lives and making mathematics a subject throughout the school day, not just during mathematics.
- using literature as a way to engage students in mathematical thinking.
- exploring technology that is appropriate for use in a preK-5 classroom.

4. Understand the theoretical underpinnings of instructional practices by

- becoming aware of the current national and state recommendations regarding the teaching of elementary school mathematics, and planning instruction that follows these recommendations.
- developing an understanding of the scope and sequence of the elementary school mathematics curriculum.
- being familiar with a wide variety of activities and manipulative materials for use in mathematics instruction.

### **Attendance**

Attendance is 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, and the ideas and concepts presented cannot be transmitted easily through class notes. For each unexcused absence, your course grade will be docked 2 percentage points. You are responsible for all announcements made in class even if you are not there. It is important that you arrive in a promptly (especially when we are at Barrow Elementary School).

### **Active Participation**

Participation in class activities is essential to your learning; simply observing is not enough. Active participation includes meaningful contributions to whole class and small group discussions and activities, asking questions, listening to and respecting the contributions of classmates, and being prepared for class and your Barrow sessions.

### **Readings**

Readings have been carefully chosen and will be discussed in class. To help facilitate discussion post your ideas about the readings in the online discussion by 8am of the class day it will be discussed. The post should be *brief* and need only contain *one idea* from the reading (something that you found interesting/surprising/important/problematic) and *one question* you have. These do not have to be perfectly formed ideas; incomplete sentences are acceptable here. You may read and respond to your classmates' posts if you like.

### **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*. The requirements for all major assignments are detailed on the following pages. Late assignments will be assessed a penalty of 10% of the grade unless there are extenuating circumstances *and you make arrangements with me in advance of the due date*. **All assignments should be submitted via WebCT by 11:55pm on the due date.**

### **Grading Procedures and Policies**

As future teachers, 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. Please

proofread your work before turning it in. If you have weaknesses in the area of grammar, punctuation, or spelling, find someone who will proofread your work for you and/or use the capabilities of your word processor before you turn it in. You may also avail yourself of the university's Writing Center (<http://writingcenter.english.uga.edu/>) for individual assistance from their tutoring staff. Assignments should be turned in on webct as word documents (file extensions .doc or .docx) double-spaced in 12 point font.

Course grades will be based on total points earned, and the following grading scale will be used to assign final grades:

**A:** 93-100    **A-:** 90-92    **B+:** 87-89    **B:** 83-86    **B-:** 80-82    **C+:** 77-79    **C:** 73-76  
**C-:** 70-72    **D:** 60-69    **F:** 59 and below

**Note:** You must earn a grade of C or higher to continue to EMAT 3410. (A grade of C- is not sufficient to meet this requirement.)

Grades will be based on the following:

Assignments (see following pages)	120 points
Activity Plans & Reports	70 points
Portfolio	55 points
Written final exam	50 points
Manipulative final exam	25 points
<u>Professionalism</u>	<u>20 points</u>
<b>TOTAL</b>	<b>340 points</b>

### **Professionalism**

Your grade for Professionalism will be based on arriving on time and prepared for class and Barrow sessions, class participation (which includes both your contributions and your reactions to the contributions of others), responding appropriately to constructive feedback in the classroom and at Barrow, and exhibiting a professional demeanor (behavior, dress, language, attitude) toward others (professors, assistants, classroom teachers, peers, children). Professional demeanor includes using a laptop computer only for academic purposes during class (e.g., not checking email, surfing the web, looking at Facebook, etc.), turning off the ringer on your cell phone and keeping it out of sight, putting away the *Red & Black* crossword puzzle/sudoku when class begins, etc.

### **University policies**

All university policies with regard to withdrawals, early final exams, academic honesty, etc. will be strictly followed. It is your responsibility to be familiar with these policies. All academic work must meet the standards contained in "A Culture of Honesty." Each student is responsible to inform him/herself about those standards before performing any academic work. Students with disabilities who require accommodations in order to participate in course activities or meet course requirements should contact me immediately.

## Tentative Course Schedule

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

DATE	TOPIC	READ and POST <i>BEFORE CLASS</i>	DUE
M, Aug. 17	Intro to Math Education		
W, Aug. 19	Prenumber Concepts	Battista & Clements	Autobiography
M, Aug. 24	Prenumber Concepts	Schifter & O'Brien	
W, Aug. 26	Counting, Number Sense	Paley	
M, Aug. 31	Place Value	Ch. 1	Paley Commentary
W, Sept. 2	Place Value		
M, Sept. 7	NO CLASS LABOR DAY		
W, Sept. 9	+ – Basic Facts, Lesson Plan	Ch. 2	
M, Sept. 14	Barrow Prep, + algorithm	Ch. 3	Lesson Plan Critique
<b>W, Sept. 16</b>	<b>Barrow 1</b>		Student Interview (F)
M, Sept. 21	Barrow Prep, + algorithm	Ch. 4	AP2
<b>W, Sept. 23</b>	<b>Barrow 2</b>		AR2 (Th)
M, Sept. 28	Calculators & computers	Stacey & Groves	
W, Sept. 30	Mental math, estimation	Ch. 5	Illuminations critique
M, Oct. 5	Parents, equity	Peressini; Linchevski & Kutscher	AP3
<b>W, Oct. 7</b>	<b>Barrow 3</b>		AR3 (Th)
M, Oct. 12	– algorithm	Ch. 6	AP4
<b>W, Oct. 14</b>	<b>Barrow 4</b>		AR4 (Th), Barrow Case (F)
M, Oct. 19	$x \div$ basic facts	Ch. 7	AP5
<b>W, Oct. 21</b>	<b>Barrow 5</b>		AR5 (Th), Case Feedback (F)
M, Oct. 26	$x$ algorithm	Ch. 8	AP6,
<b>W, Oct. 28</b>	<b>Barrow 6</b>		AR6 (Th)
M, Nov. 2	$\div$ algorithm	Ch. 9	AP6
<b>W, Nov. 4</b>	<b>Barrow 7</b>		AR7 (Th)
M, Nov. 9	Info to Fractions & Decimals	Ch. 10	AP8
<b>W, Nov. 11</b>	<b>Barrow 8</b>		AR8 (Th)
M, Nov. 16	+ – Fractions	Ch. 11	
W, Nov. 18	$\times \div$ Fractions		Draft of final portfolio
M, Nov. 23	NO CLASS THANKSGIVING BREAK		
W, Nov. 25	NO CLASS THANKSGIVING BREAK		
M, Nov. 30	Decimals & Percents		
W, Dec. 2	Ratio & Proportion		
M, Dec. 7	Manipulative performance assessment Final portfolio due		
W, Dec. 16	Final Exam 8-11 am		

### Assignment Overview

Assignment	Points	Due Date
1. Mathematics Autobiography	10	Wed, August 19
2. Paley Article Commentary	20	Wed, September 2
3. Lesson Plan Critique	20	Mon, September 14
4. Student Interview	20	Fri, September 18
5. Illuminations critique	20	Wed, September 30
6. Barrow Buddy Case	10	Fri, October 16
7. Feedback on peers' cases (2)	20 (10 each)	Fri, October 23
8. Final portfolio	5 (draft) 50 (final)	Wed, November 18? Mon, December 7?
9. Activity Plans	35 (5 each)	Each Monday by 11:55pm
10. Activity Reports	35 (5 each)	Each Thursday by 11:55pm

#### 1. MATHEMATICS AUTOBIOGRAPHY

Please provide me with a brief mathematics autobiography. The purpose of this assignment is two-fold: 1) to help me get to know you better and 2) to help you assess how you feel about mathematics, why you feel this way, and how these feelings might influence you as a mathematics teacher. Include (but do not limit yourself to) the answers to the following questions.

- ◆ Are you “good” at mathematics?
- ◆ How do you feel about mathematics? Why?
- ◆ Do you feel the same about all areas of mathematics equally? If not, which ones do you like/dislike the most? Why?
- ◆ Who or what influenced your feelings about mathematics?
- ◆ Why do you want to become a teacher?
- ◆ Describe the ideal teacher. This teacher can be a real or imaginary person. Explain why this teacher is ideal.

#### 2. COMMENTARY ON PALEY ARTICLE

Do not do this assignment before we discuss the article in class! You will read it, we will discuss it in class, and THEN you will write your commentary. This sequence is deliberate so that you can take the input of your peers into account as you write your commentary. Write a commentary on Vivian Paley's article titled “On Listening to What Children Say.” You may frame your commentary in any way you choose. For example, you might choose to describe your thoughts about a particular topic prior to reading the article and contrast them with your thoughts after reading the article. You may choose to comment on a particular point made by an author—either agreeing or disagreeing with the author's point. Be sure to explain *why* you agree or disagree. Or, the article may have stimulated you to think about something in a new way or to ponder an idea that you hadn't considered before. The article may have caused you to question either the author's ideas or your own. As long as you fully explain the dilemma you are considering, this is an acceptable format. There are numerous other possibilities as well. The point of the commentary is for you to express *your* thoughts, opinions, emerging ideas, tentative hypotheses, or quandaries. This assignment is *not* designed to assess your ability to

summarize the author's main points. Assume that I have read the article thoroughly and refer to it only as needed to support what you are saying.

### 3. LESSON PLAN CRITIQUE

You will be provided with a lesson plan to critique. You will discuss your plan with 3-4 of your peers. Following the class, you will each individually write a 500-word critique of the lesson, noting its strengths and weaknesses and describing how you would remedy the weaknesses.

### 4. ANALYSIS OF ILLUMINATIONS SITE

You will be given an activity related to working with numbers from the Illuminations web site (<http://illuminations.nctm.org/>). Explore it thoroughly (including deliberately entering incorrect answers). Briefly describe the activity. What mathematics is being addressed in the activity? What does the child need to know/understand/be able to do to be successful with the activity? What are the strengths and weaknesses of this activity?

### 5. STUDENT INTERVIEW

On the first day at Barrow you will interview your student to learn about his/her strengths and areas of potential development in mathematics. The purpose of this assignment is to provide you an opportunity to reflect on what you learn from the interview. Write a summary of the interview you conducted. The review should contain the following information:

#### General Information

- ◆ The name, age, and grade of the student you interviewed
- ◆ The teacher's name
- ◆ Any pertinent information about the child you would like to mention

#### Your analysis

- ◆ Include all of the mathematical problems you posed and a brief summary of the child's response. Say more than "The child solved the problem correctly." Explain how the child solved the problem or what the child said or did to indicate that he/she could not solve the problem. Some children will not be able to explain how they solved a problem. If this happens, simply indicate this in your summary. Note any behaviors you see the child exhibiting such as counting on fingers or moving lips.
- ◆ What did you learn from this experience? Did anything surprise you?
- ◆ What, if any, implications does interviewing have for instruction?

Note: Avoid evaluative statements about the child, such as, "she was really smart" or "he seemed slow." You do not know enough about the child to make such statements, and those statements do not provide any information. Instead, provide details, such as, "When I asked her what  $8+9$  was, she solved it by saying '8 and 8 is 16, and one more is 17.' I thought that was neat because I would not have expected a child to do that," or "I asked him this question and he just looked at me. I asked him if I should repeat the question, and he said 'no.' I did not know how else to reach him."

### 6. CASE ON BARROW BUDDY

Describe a pedagogical (not social or behavioral) dilemma you have encountered while teaching mathematics to your Barrow Buddy. The case should be approximately 2 pages long and should

provide readers with enough detail so that they feel that they have personally experienced your dilemma. Use a pseudonym for the child's name. Your dilemma should be "open" (i.e., not resolved).

## 7. FEEDBACK ON PEER CASES

You will receive 2 cases from peers on which you will provide feedback. For each case, provide a 1 page reaction to the case, giving suggestions for ways to resolve any problems or dilemmas in the case. Though you can draw from your own similar experiences, remember to address the data in the case rather than telling your own story in your feedback. You can insert your comments into the other person's paper or you can write a separate paper with your comments.

## 8. FINAL PORTFOLIO

The purpose of this assignment is to give you a chance to reflect on your growth over the semester and on the growth of your Barrow Buddy. You may be as creative as you wish in designing your portfolio. However, remember that I am much more interested in the *substance* of what you have to say than the format in which you package it. So put most of your effort into the content of the portfolio. Regardless of how you design your portfolio, you should include the following:

- ◆ A description of your Barrow Buddy. (Use a pseudonym for his/her name and use first names only.)
- ◆ A summary of your goals for your Barrow Buddy.
- ◆ An analysis of the child's successes and struggles. What did your Barrow Buddy learn and how do you know (provide evidence)? With what did s/he struggle?
- ◆ If not covered in the above, an update on your Barrow Buddy case. Briefly describe the dilemma you faced, the feedback you got, what you did, and how the situation turned out.
- ◆ An analysis of your successes and struggles with teaching. What did you learn and how do you know (provide evidence)? With what did you struggle?
- ◆ Your portfolio should show evidence of reflection and analysis on the semester. Do not simply create a "scrapbook" in which you tell a chronological story of your semester.

## 9. ACTIVITY PLANS

For each session at Barrow you will need to prepare an activity plan. The better prepared you are for your Barrow sessions the more you and your child will get out them. This should consist of a description of the general objective(s) for your student, any activities or problems that you plan to use, responses (correct and incorrect) that you think the student may give, hints you can give for a student who is stuck, questions and extensions you can offer to provide more challenge. We will spend time in class working on the first activity plan together, but as the semester progresses your responsibility for planning outside of class time will increase. Plans should be submitted by 11:55pm on each Mondays before we go to Barrow. These will be returned to you with comments the following Tuesday so that you can take suggestions into account for your Wednesday Barrow sessions.

## 10. ACTIVITY REPORTS

After the session at Barrow, the activity report should be added to the commented activity plan. The activity report should reflect what you actually did with the child and include information about any problems or successes the child had. These activities should be described in enough detail that I can figure out what you did. Put most of your emphasis (both in effort and in writing) on analyzing the child's understanding of the concepts you were addressing. A sample activity report will be posted on webct. I will make comments on your activity reports to help you think about potential activities for future

sessions. In order for these comments to be useful to you in planning your next teaching session, I need to be able to read them and give you feedback before your next planning and teaching session. Therefore, activity reports **must** be turned in by midnight on Thursday following your lesson.

Please remember that you are a beginning teacher education student and that the comments on your activity report should be appropriated to your level of expertise. You are not qualified to label or diagnose a child as "LD," "BD," "dyslexic," "hyperactive," "gifted," etc. Do not use such labels or other judgmental words in your activity report. Please remember that you are seeing this child for a very short period of time, which amounts to only a fraction of the time that child spends in school. You are also seeing the child in a highly specialized context, so the behavior (social or academic) the child exhibits with you may not be typical of his/her behavior during the rest of the school day. If you notice that your child is having some difficulty (or success) during your sessions, please describe the child's actions as carefully as possible **WITHOUT** using labels such as the ones listed above. For example, rather than writing "Joshua appears to be dyslexic," write "Joshua consistently writes his 3s and 7s backwards. He generally writes his other numbers correctly. Sometimes he also makes his Js backward when he writes his name." Your goal is to accurately describe what the child is doing, not to diagnose any learning or behavior problems the child may have. It is appropriate for you to include questions on your activity report such as, "Should I correct Joshua every time he writes a letter or numeral backwards?"

At no time should your activity report make any judgmental comments about the child's classroom teacher. It is not your place to question the teacher's methods, curriculum, assignments, or comments about a child. You will observe very little of the classroom teacher's practices, so you will not be in a position to comment on them.