Spring 2-1-2008

C&I 402.01: Teaching Mathematics K-8

Georgia A. Cobbs
University of Montana, Missoula, georgia.cobbs@umontana.edu

C & I 402: Teaching Mathematics K-8

Georgia A. Cobbs, Ph.D.
105 Education, 243-6052
georgia.cobbs@mso.umt.edu
Office hours as posted or by appointment

"Education is not the filling of a pail, but the lighting of a fire."
William Butler Yeats

Overview

This course is an opportunity to build a conceptual and pedagogical framework for mathematics education, K-8. Throughout the course, the student will get acquainted with elementary and middle school mathematics topics, methods, and materials. In addition to content, other areas to be explored include: curriculum changes, current research in mathematics education, professional organizations, including the National Council of Teachers of Mathematics (NCTM), School Science and Mathematics (SSMA), MEA/MFT and other professional organizations.

Goals of this course:

1. Gain a good view of mathematics
2. Learn about and how to construct problem-based, student- centered approaches to learning.
3. Mathematics is intrinsically rewarding to learn and to teach!

Student Objectives

1. The students will learn NCTM Standards (2000) for teaching of mathematics K-8. They will become acquainted with topics within these standards and an appropriate methodology for difference development levels.
2. The student will be able to develop worthwhile tasks centered on the six Professional Standards for Teaching Mathematics of the NCTM Standards (1991) using a variety of teaching methods and/or materials.
3. The student will become aware of the different learning styles, individual, multicultural and gender differences in children and make applications to their lessons.
4. The student will learn different ways to assess and evaluate students' progress in a mathematics curriculum. We will evaluate ways to assess and discuss different rubrics.
5. The student will become acquainted with professional organizations and various research activities that support and influence the teaching of mathematics. (NCTM, SSMA, MCTM, MEA/MFT)

Required: Van De Walle, J. (2007) *Elementary and middle school mathematics: Teaching developmentally.* White Plains, NY: Pearson Education, Inc. http://wps.ablongman.com/ab_vandewalle_math_6

Bay-Williams, J. M. (2007). *Field Experience Guide: Resources for Teachers of Elementary and Middle School Mathematics.* White Plains, NY: Pearson Education, Inc.

Equithe, R. (2007) *Teach like your hair's on fire.* New York: The Columbia Press

Welchman-Tischler, R. (no date). *Start with Manipulatives*. Vernon Hills, IL: ETA/Cuisenaire.

On reserve in TRC:

Texas Instruments (1995). *Uncovering Mathematics with Manipulatives and Calculators.* Jacksonville, TX: Author. (There are 2 levels: K-2 and 2-6)

Assignments

Attendance/Participation (10%): Attendance and participation is very important on a daily basis. Journal entries will be included as your participation grade. Many pertinent ideas are discussed and covered only in class. Being present and *actively participating* are aspects of your grade. Communication in class is important. If you need to miss, please email or leave a message, this is **a professional courtesy. No more than 2 absences will be permitted.** If you are absent more than 2 times, you may drop a letter grade. Please be professional in your presence and interactions on campus. You are building a professional profile now, project the data you want us to collect!

Teaching I (15%): Prepare a hands-on, minds-on lesson (over 2 days) introducing a concept using a problem based lesson you will teach in your field placement. You learn by following up with the students. *The DRAFT will be reviewed* by me. Sign up for a conference. Afterwards, set up a time to be observed by your mentor. *Reflect as a team* or you may choose to reflect individually, using questions on p.32 in Bay-Williams. Final Lesson Plan & Reflection due **March 3.**

Quizzes (20%) There will be 2 quizzes early in the semester. Please read the assigned chapters from the Van De Walle text.

MARS (Mathematics Activities, Resources and Standards) (10%) As a team of 2-3, you will explore a problem-based activity in class. You will need to find which NCTM Content & Process Standard and Focal Point it is addressing, grade level it is geared toward, a children's literature book that uses the concepts, a movie from the Future's Channel that applies the concept, and a manipulative (from your kit) that could be used to teach it. Any TI-calculator lesson tied to this concept? You will present your findings to class. In addition, we will explore various curriculum and you will discover various ways textbooks present this info and write a brief explanation of 2 types of texts: traditional and reform-based. **Presentations start Feb 4th, paper due by Feb 20th.**

Marilyn Burns Videos

VT 04265	Base-Ten Blocks
VT 04266	Color Tiles
VT 04267	Cuisenaire Rods
VT 04268	Geoboards
VT 04269	Pattern Blocks

Blog Postings (15%) Throughout the semester you will be asked to explore mathematics on the web and blog. This will involve outside class time. The results will be posted on-line so the all can read and learn from the postings. See the Postings info for details mentioned below. http://spring2008elementaryblock.blogspot.com/

Assessment of Mathematical Teaching (AMaTe) (15 %): In your field placement or in a Flagship Program, work with a student who is struggling with a mathematical concept. Meet with me once with your partner (if your students are in the same class). Let's talk about what the student is struggling with. I can provide more individual comments and you more help for the student. Then, you will interview the student about perspectives on teaching and learning math. What level of Kohlburg (Equithe, 2007) is your student on? Write a summary of student's comments and reflection of the sessions. See handout for more info. **Due April 21.**

Integrated Unit (15%): Adhere to Unit Outline given in seminar. Any questions, please ask. Due by **April 28th in seminar.**

Evaluation Grading Scale

A	95-100
A-	92-94
B+	90-91
B	87-89
B-	84-86
C+	81-83
C	78-80
C-	76-77
D	68-75
F	<68

All written assignments must be printed with a letter quality printer and are due at class time of the assigned day. **Late assignments are not accepted.**

Graduate Students- Select and research a mathematics educational issue of interest: use of calculators, ethnomathematics, same gender classes. Prepare a 20-minute powerpoint (ppt) that supports a class discussion you lead! PPT should include: clear introduction, well-organized progression of topic, at least 3 points for a class discussion; purposeful connections to the mathematics education community; recommendations; annotated bibliography of resources. This project is worth an additional 40 points; but follow the same grading system as listed below (95-100% A; 92-94% A-, etc.) Please notify me by the end of the second week of class to discuss your interest in the graduate increment.

Academic Honesty All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at http://www.umt.edu/SA/VPSA/index.cfm/page/1321

Evacuation Action Plans

Primary Route: Nearest exit
Outdoor Rally Points South of Ed Bldg…at least 300 Feet from the building!!
Indoor Rally Point: McGill Hall
Always assume the emergency is real. Take valuables, building may be closed for some time!

Informative WEBSITES

http://wps.ablongman.com/ab_vandewalle_math_6 This supports this course & your text.

http://del.icio.us/Georgia.Cobbs: my favorite websites such as:

http://matti.usu.edu/ Manipulative site by standards and grade level

www.montanamath.org This is Montana's math website. Present at MEA in Missoula in Oct 2008. See me for details about submitting a proposal.

http://www.figurethis.org/ NCTM developed to build the math community with families

http://mathforum.org/dr.math/Try the self-guided tour. Formulate a question to Ask Dr. Math. Get your students involved!

http://math.rice.edu/~lanius/Lessons/
This is an excellent site of interactive lessons students can do as a center or you can lead them through it projecting it on screen.

More lesson ideas http://illuminations.nctm.org

Dynamic Calendar
Spring 2008

Info	Week/Date	Topic	Resources & Assignments
Part I Foundation for teaching mathematics	1 Jan 23	Overview MARS Activities	Blackboard, del.icio.us **Read**: Chapters 1-2 **Match** activities w/ NCTM Standards **Blog**: Post #1 See question **AMaTE: Part I**
	2 Jan 28 Jan 30	*NCTM Standards Math Reform* Worktime on MARS	**Read**: Chapters 3 Preparing for conditions of the quiz http://mathematicallysane.com/analysis/reformvsbasics.asp **Blog:** Post #2 Compare M/S Standards
Part II Problem Solving	3 Feb 4	*What is problem solving?* *Kay Toliver*	**MARS Due** View Kamaii video We will view video & discuss **Quiz # 1** **Read** Chapter 4-6
	Feb 6	*NSF Curriculum*	**Meet in Mansfield** Section I: St Lrng Center Sect II. Buckhouse Everyday Math v. Math Trailblazers **AMaTE: Part II**
Part III Lesson Planning & Teaching	4 Feb 11 Feb 13	Force/Jet Toy NCES Graph	Intro to the SAE Curriculum Preparing for conditions of the quiz **Quiz** #2 **Blog**: Post #3
	5 **No class** Mon 18th Feb 20	**Presidents' Day** *Conference*	**Presidents' Day:** Happy B'day: George & Abe ***Wednesday**: Conference w/me* *Bring **DRAFT** of plan*
	6 Feb 25 Feb 27	**TEACH**	**TEACHING IN THE FIELD** **AMaTE: Part III** **Blog:** Field Experience
Part IV Integration	7 Mar 3 Mar 5	**Lit & Math**	**DUE**: Lesson Plan & Reflection Literature & Mathematics

			http://sci.tamucc.edu/%7Eeyoung/literature.html
	8 Mar 10 Mar 12	**AIMS/GEMS** **Tech**	**AMaTE: Part IV** calculators
	9 Mar 17 Mar 19	**Tech**	Technology: Websites, CBLs & calculators
	10 M 24-28	**SPRING**	**BREAK**
	11 Mar 31 Apr 2	Fractions Pattern Blocks	**Do Worksheet** **Read Fraction Article on Blackboard**
	12 Apr 7- 9	**TEACH**	**TEACHING IN THE FIELD**
	13 A14- 16	**TEACH**	**TEACHING IN THE FIELD**
Part V	14 Apr 21 Apr 23	 Algebra	**DUE AMaTE** Lab Gear
Mathematics Community	15 Apr 28	Maps Excel, Comm. Walk	
	Apr 30	Math Comm	Tools