Spring 2-1-2007

C&I 402.01: Teaching Mathematics K-8

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C & I 402: Teaching Mathematics K-8

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"Technology is an essential tool for teaching and learning mathematics effectively; it extends the mathematics that can be taught and enhances students' learning."
NCTM Position Statement on Technology

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), 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:

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

Kohl, H. (1994) *I won't learn from you.* New York: The New 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)

Optional: 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`

Assignments

Attendance/Participation (15%): 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, let us all collect the data you want to project!

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 the Professional Standards. See appendix B in text. Final Lesson Plan & Reflection due **March 12.**

Quizzes (10%) Go on-line http://wps.ablongman.com/ab_vandewalle_math_6 take 2 quizzes from Chapters 1 and 2. The summaries are there, review questions and practice tests. After taking a test (and getting the grade you want!) email me the results! It may be that I will have to grade the short answer aspect. If you need to borrow a book, please let me know.

Mathematical Manipulative Project (M & M) (15%) As a team of 4, you will develop a problem-based activity (teaching a mathematical concept) with a manipulative from your kit. Then we will split out and individuals will present in small groups. Then, again, individually write a brief 3-5 page paper. Your paper will address teaching in a conceptual manner, a specific NCTM content standard, how your method compares with the same concept presented in an elementary text compares to a methods text describes how to teach the concept. How would you address cultural differences in the teaching of this? Especially address Native American and/or any minority represented in your class. Get to know your class before you write this paper. Due Feb

BlackBoard Postings (BB) (5%) Two times throughout the semester you will be asked to explore mathematics on the web and post. This will involve some outside class time. The results will be posted on-line so the entire class can read and learn from all the postings. See the BB Postings info for details mentioned below.

Assessment of Mathematical Teaching (AMaTe) (20 %): In your field placement or in a Flagship School, work with a student who is struggling with some 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. Write a summary of student's comments and reflection of the sessions. See handout for more info. **Due April 6.**

Integrated Unit (20%): Adhere to Unit Outline given in seminar. Any questions, please ask. Due by **April 30th in your 402 class.**

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- Please see me about the graduate increment to receive graduate credit. You will complete an additional project throughout the course of the semester. Typically students complete an action research project in the schools or create additional lessons/ learning centers etc. with assessment of the results. Another choice may be to participate in a graduate seminar throughout the term. 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.

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

Informative WEBSITES

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

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

www.montanamath.org This is Montana's math website.

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

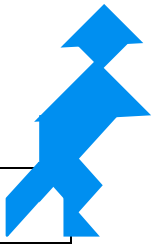
http://mathforum.org/dr.math/Try the self-guided tour. Formulate a question to Ask Dr. Math. Get your students involved!

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.

http://nctm.org National Council of Teachers of Mathematics for Standards

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

http://www.goENC.com/ A National Clearinghouse for math and science materials



C & I 402 Dynamic Calendar
Spring 2007

Week	Topic	Readings, Assignments
1 Jan 22	Course Overview: Activities & Standards	Journal in class daily Activities
Jan 24	Scavenger Hunt with Scott Hohnstein	Chap 1 **Quiz, 1/26**
2 Jan 29	Reform in mathematics, NCTM Standards	**Math reform**
Jan 31	Planning, Kamaii video, types of teaching	
3 Feb 5	Toliver Tape: Welcome to Mathematics	Chap 2 **Quiz, 2/9**
Feb 7	M & M Projects presented:	Base-10; C-Rods
4 Feb 12	M & M Projects presented:	Tangrams, geoboards
Feb 14	M & M Projects presented:	Pattern Blks, C-Tiles
5 Feb 19	**Presidents' Day:** Happy B'day: George & Abe	No class
	Assessment: Rubrics http://www.4teachers.org/	**Grade Billy's test**
Feb 21	Conference with me, bring draft of lesson plan	Sign up for a time **M & M Paper due**
6 Feb 26	**TEACHING IN THE FIELD**	Sign up w/mentor
Feb 28	**TEACHING IN THE FIELD**	
7 Mar 5	Literature & Mathematics **http://sci.tamucc.edu/%7Eeyoung/literature.html**	**Teaching I Due** Various books!
Mar 7	Fraction article, calculators	Read article: BB?
8 Mar 12	**Flight: Intro to the SAE Curriculum**	
Mar 14	**Flight: Build planes, SAE Curriculum**	**BB# 1**
9 Mar 19	Technology: Websites, CBLs & calculators	SAE materials
Mar 21	Technology: Websites, CBLs & calculators	
10 Mar 26-30	SPRING BREAK!	Enjoy!!!
11 Apr 2	Meet with me about AMaTe	
Apr 4	Meet with me about AMaTe	**AMaTe Due**
12 Apr 9	Algebra lab gear	Article on BB?
Apr 11	**TEACHING IN THE FIELD**	**Technology lesson:**
13 Apr 16	**TEACHING IN THE FIELD**	Computer, calculator
Apr 18	**TEACHING IN THE FIELD**	Or SmartBoard
14 Apr 23	Algebra lab gear	
Apr 25	*Read I won't learn from you!*	Groups report out
15 Apr 30	Mathematics, maps, & mountains using Excel	**BB #2**
May 2	Mathematics Community: Manipulatives, Classroom management & Cost	**Units Due April 30th**
Finals Meeting	Section 1: Tue, May 8, 10:10-12:10 ED 113 Section 2: Tue, May 8, 1:10-3:10 ED 215	Pick up units **after 2 pm May 11**

Blackboard (BB) Postings

BB#1 Critique Integrated Curriculum

- Choose integrated curriculum from two different sources and compare to an elementary math/science textbook. Each group should have different topics to share.
- Two persons will research a K-5 curriculum: K-5: AIMS or GEMS
- Two persons will research 6-8 curriculum: 6-8: SAE and IMaST
- Choose a specific content standard.
- Compare how the concepts are presented. Again, think about conceptual and procedural knowledge.
- What NCTM process standards are covered?
- Compare/contrast this to how Van De Walle or another methods text presents the concept.

BB #2: Mathematics Community

- List important components of a mathematics community.
- How will you insure they are part of your classroom.
- Remember to include cultural components, parental contacts.
- How will you maintain your connection to the mathematics community?

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To access Blackboard: courseware.umt.edu
Use your SCUID number.
When you log into cyberbear, it is listed.
Your password is the last 6 digits of your student ID number.
Then you can change it.
Need assistance: SCUID # call 243-2606
Password: 243-2974 (closes at 5pm)

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View the video on the manipulative for your MM Project.

Marilyn Burns Videos

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

For Tangram ideas, see me and/or the web!