



## ELED 530 – Mathematics Curriculum Grades 1-8 COURSE SYLLABUS: FALL 2013

**Instructor:** Dr. Adrienne Sanogo

**Office Location:** Virtual Office

**Office Hours:** By Appointment

**Office Phone:** (405)269-5416

**Office Fax:** N/A

**University Email Address:** [Adrienne.Sanogo@tamuc.edu](mailto:Adrienne.Sanogo@tamuc.edu).

### COURSE INFORMATION

#### Materials – Textbooks, Readings, Supplementary Readings:

##### Required Texts/Materials:

- Van de Walle, J.A., Karp K.S. & Bay-Williams, J.M. (2010). Elementary and Middle School Mathematics: Teaching Developmentally (7th Edition), Pearson Education, Inc. Note: A digital version of this textbook is available on coursesmart.com.
- Parrish, S. (2010) *Number Talks: Helping Children Build Mental Math and computation Strategies, Grades K-5*. Math Solutions. (ISBN: 9781935099116) – Be sure to get the one with the DVD included.
- Texas Essential Knowledge and Skills (TEKS) – Mathematics K-8 available on the course website
- Handouts/Articles on the course website

##### Optional Texts (You do not have to purchase these books but they are a wonderful resource for you to have for your classroom):

- Wheatley, G.H., & Reynolds, A. (2010). Coming to Know Number: A Mathematics Resource for Elementary Teachers. Mathematics Learning.
- Wheatley, G.H. & Abshire, G. (2007). Developing Mathematical Fluency: Activities for Grades 5 through 8.
- Wheatley, G.H. (2007) Developing Spatial Sense in Mathematics. Second Edition.
- NCTM. (2013). Putting Essential Understanding of Fractions into Practice, NCTM (ISBN: 978-0-87353-732-2)
- NCTM. (2010). Developing Essential Understanding of Rational Numbers: Grades 3-5. NCTM, Reston, VA. (ISBN: 978-0-87353-630-1)
- Clements, D. H., & Sarama, J. (2009). Learning and Teaching Early Math: The Learning Trajectories Approach. Routledge. (ISBN: 978-0-415-99592-4)
- Chapin, O'Connor, & Canavan-Anderson. (2013). Classroom Discussions in Math: Grades K-6, Math Solutions. (ISBN: 978-1-935099-56-7).

#### Course Description:

ELED 530 identifies novel research-based recommendations toward a modernization of both content and methods of elementary mathematics teaching and learning, and relates these

innovations to good teaching practices already in use. The course includes the language of number sets, number systems, the means for improving student performance through problem solving, and techniques for identifying areas of student accomplishment and difficulty.

### **Student Learning Outcomes:**

Through online demonstrations, discussions, and presentations as well as out of class readings and written work, ELED 530 students will have the opportunity to:

- Examine their beliefs about the goals and content of elementary and middle school mathematics in relation to current reform documents.
- Develop their ability to create an environment for the learning and teaching of mathematics that promotes problem solving with understanding and sense making.
- Learn about the content and methods in mathematics education to assist them in designing mathematical tasks and activities.
- Explore the connections that exist within mathematics topics and with other content areas.
- Develop their ability to assess diverse groups of students in particular mathematics topic areas at various grade levels.

## **COURSE REQUIREMENTS**

### **Instructional / Methods / Activities Assessments**

Assignment schedule, details, and due dates will be posted in the course website. It is your responsibility to make sure that all assignments are submitted correctly and on time, according to the assignment instructions. Any assignment not submitted correctly or on time will be considered late. Late assignments will receive a penalty of 10% per day late.

#### **1. *Online Discussions* - (20%)**

Online discussions are an integral part of this course. Each week you will be placed in a learning group. You will each read and discuss the same articles/text/homework. Each week a group facilitator will be chosen. The group facilitator will be responsible for posting discussion questions and facilitating group discussion. The facilitator must post discussion questions to the discussion thread by Monday at 7:00 PM.

##### **a. *Quantity of Online Postings:***

Active participation in course discussions is a major aspect of this course. For each weekly discussion, you are expected to respond to the group facilitator and instructor's questions by Thursday, 11:59 PM after the instructor and group facilitator posts his/her initial post(s), then respond to AT LEAST three (3) other participant's posts by Saturday, 11:59 PM. Please note that this is considered minimal attendance and participants meeting the minimal requirements will receive a grade of C on their online discussions.

##### **b. *Quality of Online Postings:***

Your posts should be comparable to the kinds of comments you would make during face-to-face class sessions. A three-page essay will not lend itself to a quality discussion. On the other hand, neither will saying "I agree!" Please consider this when you post. The quality of the online discussion is contingent on the quality (not length) of the posts in the discussions. A rubric of quality discussions is provided in course website. Note: Also see the Netiquette section below for tips on appropriate discussion board behavior.

##### **c. *Instructor Participation in Online Discussions:***

The instructors will actively participate in the course discussions but will not interfere with student-to-student discussion unless necessary.

**2. Weekly Reflection – (5%)**

After class each week, you will be required to reflect upon what you learned from the weekly readings, assignments, class discussions, and activities. You will turn in a 1 ½ – 2 page summary to the D2L dropbox by Monday at 11:59 PM. There will be no summary for the last week of class. In your summary, address the following questions:

- a. How did your knowledge of teaching mathematics change? Be specific here.
- b. What are you still trying to make sense of and how do you plan to increase your understanding of these concepts?
- c. How will you use what you learned this week to change your current practice?
- d. What other ah-ha's/concerns/comments do you have about the readings, class discussions, and activities this week?

**3. Research Literature Investigation and Structured Abstract (10%)**

Each student will select 1 article each week that describes a research study related to the topic of the week to read, analyze, and synthesize. Each article must appear in a peer-reviewed research journal and report the design and results of a research study. Students will "sign up" for particular articles on the course website in order to eliminate duplications. Each student will compile a summary of the research investigated (with a limit of 1 single-spaced page/article) and post on the course website for the other members of the class. Students will also post an electronic copy of the articles on the course website. (See attached rubric.)

Each summary should include the following:

- a. APA citation
- b. Research Question(s) or Purpose
- c. Theoretical Framework/Perspective/Conceptual Framework
- d. Methodology/Data Sources
- e. Findings/Arguments Presented

(The instructor realizes it will be difficult to get all this information on 1 single-spaced page, but in the end you will have a helpful resource that summarizes many different research pieces.)

**4. High Cognitive Demand Task Design and Presentation (30%)**

**High Cognitive Demand Tasks:** (5%) Due: September 29<sup>th</sup> to the Dropbox by 11:59 PM. Choose a concept that you plan to teach to your students. Develop two high cognitive demand task will engage your students in mathematical thinking about this concept. For each task, provide a 3-4 sentence rationale justifying why the task qualifies as high cognitive demand. Be sure to reference theory in your justification.

**Assessment Development:** (5%) Due: Sunday, October 13<sup>th</sup> to the dropbox by 11:59 PM. Develop both a formative and summative assessment that you would use to assess student learning on the tasks you created. Be sure to include any tools you would use to assess student learning.

**Implementation and Teacher Case:** (10%) Due: Sunday, Nov 10<sup>th</sup> to the dropbox by 11:59 PM. With your class, implement your high cognitive demand tasks. You should reflect and journal about the experience and then write a case story that paints a picture of the episodes and your thoughts and comments about students thinking and your implementation of the task.

**Analysis of Student Work:** (5%) Due: Sunday, Nov 24<sup>th</sup> by 11:59 PM to the dropbox. Using the assessments you created, analyze student work on the high

cognitive demand tasks and provide a description of misconceptions and error patterns you found in student work. Provide samples of student work and create both quantitative and qualitative descriptions of your students' understanding.

**Presentation of Project:** (5%) Create a Video, Prezi, Multimedia, or narrated PowerPoint presentation that highlights this entire project. You will share this presentation with your peers the week before finals.

#### **5. Homework Assignments (10%)**

Each week you will be assigned problems to solve that focus on pedagogical knowledge, content knowledge, and pedagogical content knowledge. Your solutions to these problems will provide a background for some of the class discussions. You will discuss some of your solutions in your group discussions.

#### **6. Midterm Exam (10%)**

This exam will include content knowledge, pedagogical content knowledge and pedagogical knowledge.

#### **7. Final Exam (15%)**

This exam will include content knowledge, pedagogical content knowledge and pedagogical knowledge over the entire semester.

### **Grading**

|   |                 |
|---|-----------------|
| A | = 90% - 100%    |
| B | = 80% - 89%     |
| C | = 70% - 79%     |
| D | = 60% - 69%     |
| F | = 59% and below |

### **Student Expectations and Plagiarism**

Student work will be expected to show evidence of creativity and the use of critical thinking skills. Merely restating someone else's work is not adequate for graduate level assignments. If an original work is directly or indirectly quoted, it must be so noted. To do otherwise is plagiarism. Any plagiarism is grounds for a zero on the submitted work, and possibly for failing the course or being expelled from the university.

Remember that you are responsible for your learning. I will help you as much as possible, but you must let me know that you are having problems or questions that you cannot answer. As your instructor, I am available to help you in any way possible. Please feel free to contact me.

### **Written Assignments:**

- All written assignments are to be typed and are expected to exhibit professional quality. In all assignments, you should use 12 point size, Arial or Times Roman font, one-inch margins on all four sides of the page, and text should be double spaced.
- You should demonstrate mastery of organizing, structuring, and editing (for all aspects of mechanics) in your writing. Student work is expected to be well-written, logical, and easy to read and follow.
- Excessive errors in grammar, spelling, and vocabulary will result in the reduction of your score by at most a letter grade.
- Late assignments will receive a 10% per day penalty.

### **Internet Etiquette (Netiquette)**

All participants are expected to maintain a level of professionalism in all aspects of course communication. In order for all participants to feel invited to participate in this course, please

abide by commonly accepted online behavior standards, known as “netiquette.” See “Netiquette” in the course website.

## **TECHNOLOGY REQUIREMENTS**

- Hardware--- Both Macintosh and Windows systems are acceptable
- Software ---Word Processor and Calculations Spreadsheet
- Connectivity---Reliable internet access through an established internet service provider is required for online learning activities. Students should choose a DSL or cable-modem service where high speed internet is available.
- Email---Access to a reliable email service through an established internet service provider is critical for assignment submission and communication with instructor.
- Web Browser---Internet Explorer (version 8.0 or greater), Netscape (version 9.0 or greater), Firefox, or Safari is required. These browsers are available for free

## **ACCESS AND NAVIGATION**

This course will utilize the e-college online classroom. You will be required to complete assignments, discussions, etc... through the e-college system.

## **COMMUNICATION AND SUPPORT**

### **Interaction with Instructor Statement:**

I am here to help you do well in this course. However, you are an adult learner and it will be your responsibility to ask for help if needed. You may contact me through Skype, phone, e-mail, or chat. In order to receive a prompt response to your e-mail correspondence with your professor, please put “ELED 530” in the subject line. For example: your subject line could read: **ELED 530: Question about the discussion assignment.** I will respond to your e-mails within 48 hours.

## **COURSE AND UNIVERSITY PROCEDURES/POLICIES**

### **University Specific Procedures:**

#### *ADA Statement*

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

**Office of Student Disability Resources and Services  
Texas A&M University-Commerce  
Gee Library 132  
Phone (903) 886-5150 or (903) 886-5835  
Fax (903) 468-8148  
[StudentDisabilityServices@tamu-commerce.edu](mailto:StudentDisabilityServices@tamu-commerce.edu)  
[Student Disability Resources & Services](#)**

### *Student Conduct*

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. (See *Code of Student Conduct from Student Guide Handbook*).

## **COURSE OUTLINE / CALENDAR**

### **Brief Course Outline**

**Week 1:** Get to know you activities, establishing an online community, Teaching and Learning Mathematics in the 21<sup>st</sup> Century

**Week 2:** Teaching Mathematics Through Problem Solving and Planning in a Problem-Based Classroom, High Cognitive Demand Tasks

**Week 3:** Early Number Concepts: Subitizing, Cardinality, Conservation, Constructing Number, Number Talks – Discussions in the Mathematics Classroom, Learning Trajectories

**Week 4:** Number Relationships and Beyond, Assessment, Teaching Mathematics to All Learners (RTI, Culturally Responsive Pedagogy, Modifying Instruction for ELL learners, Meeting the Needs of Gifted Learners)

**Week 5:** Meaning of the Operations – Addition and Subtraction, Mastering the Basic Facts – Addition and Subtraction, Teaching Mathematics with Technology

**Week 6:** Whole Number Place Value Concepts and Computational Fluency with Addition and Subtraction, Estimation Strategies

**Week 7:** Multiplicative Reasoning, Meaning of the Operations of Multiplication and Division, Mastering the Basic Facts for Multiplication and Division, Computational Fluency with Multiplication and Division, Estimation Strategies

### **Week 8: Midterm Exam**

**Week 9:** Developing Fraction Concepts

**Week 10:** Developing Strategies for Fraction Computation

**Week 11:** Developing Concepts of Decimals and Percents

**Week 12:** Algebraic Reasoning and Developing Concepts of Exponents, Integers, and Real Numbers

**Week 13:** Proportional Reasoning

**Week 14:** Teaching Geometry and Measurement

**Week 15:** Teaching Data Analysis and Probability

### **Week 16: Final Exam**