EDN 325: Foundations of Geometry, Measurement, and Data (K-6)

"The essence of mathematics is not to make simple things complicated, but to make complicated things simple." – S. Gudder

Professor:
Maggie Guggenheimer

EDN 325-001:
Friday
9am – 11:45am

Course URL:
http://learn.uncw.edu

E-mail: guggenheimerm@uncw.edu
Phone: 910.232.1961
Office Hours:
online and by appointment

UNCW Catalog Description

Prerequisites: EDN 301 and EDN 322. Focus on the curriculum, materials, and methods appropriate for the teaching of geometry, measurement and data for the kindergarten through sixth grade level.

Conceptual Framework

The Watson College of Education strives to develop knowledgeable and proficient education professionals dedicated to improving schools and society. EDN 325: Foundations of Geometry, Measurement, and Data (K-6), supports this framework through discussions, class activities, readings, projects, and evaluations. These projects afford students the opportunity to develop the following competencies.

- Ability to question, investigate, explore, and problem solve mathematical situations
- Reflective practice
- Commitment to ethical and professional standards
- Knowledge in academic content and pedagogy
- Technology integration
- Ability to meet needs of diverse learners
- Knowledge in how to create a nurturing environment where students feel safe in developing their mathematical abilities

Individual student growth in these areas will result in educational practice that positively impact learning.

REQUIRED TEXTS:

1) ***Foundations of Geometry, Data and Measurement (K-6)***, Pearson Custom Education Text. ISBN 9780558602574 (Required)

-Available for purchase in the UNCW bookstore

2) **Course packet**. EDN 322/325, The Teaching of Mathematics K-6 (REQUIRED)
- Available on ED lab webpage http://www.uncw.edu/ed/edlab/documents/MathPacket1.14.pdf

3) ***Teaching Children Mathematics*** - You will have access to Teaching Children Mathematics which is a professional journal addressing the teaching and learning of mathematics in grades pre-K-6. Teaching Children Mathematics is published by the National Council of Teachers of Mathematics (NCTM). Randall Library subscribes to this journal, so you may choose to access the journal through the library. You can, however, access this journal online by purchasing a NCTM student E-membership. Cost of the student E-membership is $42 and is valid for one calendar year. (The student E-membership is one-half the cost of the regular membership and is only available to students registered in an accredited university as a full-time student.) When registering, you will need to select the Teaching Children Mathematics e-journal. This membership will also give you access to a variety of additional resources including the Principles and Standards for School Mathematics which I recommend you taking the time to read. More information can be found at the following web address: http://www.nctm.org/membership/content.aspx?id=7618 (Access to the journal is REQUIRED and online access with membership into NCTM is STRONGLY RECOMMENDED.)

The following list of articles from *Teaching Children Mathematics* will be read at various points throughout the semester:

Carter, S. (2008). Disequilibrium & questioning in the primary classroom: Establishing routines that help students learn. *Teaching Children Mathematics*, 15(30) 134-137.

Covington- Clarkson, L., Robelia, B., Chahine, I., Fleming, M., & Lawrenz, F. (2007). Rulers of different colors: Inquiry into measurement. *Teaching Children Mathematics*, 14(1) 34-39.

Lovin, L. H., Mason, J., & Shifflett, E. (2009). Generating meaning for range, mode, median, and mean. *Teaching Children Mathematics*, 16(4), 246-253.

Magner, J. (2008). Investigations: Reflections and kaleidoscopes: Not always what you expect. T*eaching Children Mathematics*, 15(2), 80-86.

Robichaux, R. R. & Rodrigue, P. R. (2010). Polygon properties: What is possible*? Teaching Children Mathematics*, 16(9), 524-533.

COURSE TOPICS

1) NCTM Standards

2) Measurement
   a. Length
   b. Area
   c. Weight
   d. Time
   e. Temperature
   f. Perimeter
   g. Volume

3) Geometry:
   a. Two and Three Dimensional
   b. Visualization
   c. Spatial Reasoning
   d. Transformations
   e. Symmetry

4) Probability

5) Data Analysis
   a. Categorical and Numerical Data
   b. Data Collection and Analysis
   c. Stem and Leaf Plots

COURSE OBJECTIVES

The assessment plan correlates with the course objectives and indicates how the student demonstrates acquisition of concepts and skills. Upon successfully completing this course, the student should be able to:

1. Demonstrate knowledge of standards-based mathematic curricula, the key elements of the National Council of Teachers of Mathematics Principles and Standards for School Mathematics and key elements of the Common Core State Standards Initiative.

2. Generate instructional sequences on topics related to geometry, measurement, data analysis, statistics and probability.

3. Relate selected concepts in learning and child development to mathematics instruction.

4. Identify and use various instructional strategies and techniques (cooperative and peer group learning, workshops, problem-based lessons and teacher-directed presentations, etc.) to teach topics in geometry, data, and measurement that are appropriate for all children in grades K-6.

5. Identify and use selected manipulatives and technology to teach geometry, data, and measurement content for grades K-6.

6. Integrate mathematics content with other elementary subjects.

7. Develop an understanding of assessment as a formative tool used to begin to understand each student as a mathematician and guide instruction and student learning by meeting individual needs.

8. Modify mathematics curriculum and instruction to meet individual needs.

9. Investigate the importance of providing mathematical experiences for students who have been denied access in any way to opportunities in mathematics as well as those who have not.

10. Solve problems in the mathematical content areas of geometry, measurement, data analysis, statistics, and probability for adaptation to grades K-6.

EDN 325 ASSIGNMENTS AND GRADING

A) Blog with Article Reviews – 20 points

You will develop a blog about yourself.

You will read and react in writing to professional journal articles related to elementary (K-6) mathematics education in your blog.

Reading journal articles is one way to keep up-to-date in the teaching field.

B) Data Project – 20 points

You will think of a question that leads to a data investigation. The question might relate to some issue about education, about your community, your peers in this course, or just something that interests you. However, the investigation must involve numerical data.

You will follow the statistical process.
Formulate Questions, Collect Data, Analyze Data, Interpret Results

The final product will be in the form of a PowerPoint.

C) Math Lesson Plan, Video and Reflection -15 points

You will develop a math lesson plan (5 points) to implement during your Monday school visit which is October 27th. You will videotape your entire lesson (5 points) and bring the clip to class the following Friday for review. You will follow up with a reflection (5 points) of both the plan and classroom application.

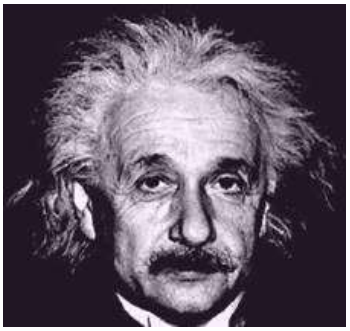
D) Annotated Bibliography – 10 points

Create an annotated bibliography consisting of 20 websites for elementary-age children.

Web Site Annotated Bibliography:
Identify at least 20 different web sites that are useful in mathematics instruction. (Note: This means you will view many more sites, but you will select the best twenty.) Provide an annotation for each that includes a bibliographic citation in APA format, a brief summary of the recourses available at the site, and the age/grade level for which the web site is most appropriate.

E) WebQuest – 15 points

You and your classmates will embark on a journey to the past to study a famous mathematician. You will use the internet and other resources to learn about the personal and professional side of your chosen mathematician in order to create an online bulletin board, picture book or interactive poster that tells the story of him or her.



F) Tests – 20 points

-Tests are scheduled online and will include class lectures and readings.

-Test #1 – 10 points
-Test #2 – 10 points

Grade	Points	Grade	Points
A	94- 100%	**C+**	77-79
A-	90-93	**C**	74-76
B+	87-89	**C-**	70-73
B	84-86	**D**	60-69
B-	80-83	**F**	< 60

Class Participation and Attendance

This course is built upon the belief that your knowledge about teaching mathematics is socially constructed as you discuss, reflect upon, and experience mathematics as part of a community of learners. It is impossible to participate in a community of learners when you are not present. Therefore, **attendance is expected at all class meetings.** Please be prompt! Absences, late arrivals, and early departures will negatively impact your grade. If an emergency occurs, it is your responsibility to let me know if you are unable to attend class as soon as possible. We have limited time together in the classroom (only 11 class sessions) and missing more than one (1) on-campus class will result in a one letter grade reduction. In the event of an absence during your Field Experience (a Monday or during your two week Mini-Internship), you must contact your teacher as soon as possible and make sure that all lessons/materials are made available and then contact your lead professor. Any missed time in the classroom must be made up. You will be responsible for making arrangements with your teacher.

Course Schedule

Honor Code

The Honor Code will be enforced in this course. Honesty in your academic work will develop into professional integrity. The faculty and students at UNCW will not tolerate any form of academic dishonesty.

See UNCW Honor Code at: http://uncw.edu/odos/honorcode/

Major Assignments at-a-glance:

Initial Blog: 8/29 and ongoing

Web Site Bibliography: 9/12

Data Project: 9/3

WebQuest Project: 12/3

Math Lesson Plan: 10/24

Video and Reflection: 10/31

Week	Topic	Readings	Assignment Due
Friday, August 22	I. Course Introduction/Revisiting the NCTM Standards and Principles/ Categorical and Numerical Data		
Friday, August 29	II. Data Analysis: The Statistical Process	Chapter 3	Initial Blog
Friday, September 5	III. Data Analysis		
Friday, September 12	IV. Data Analysis: Data Displays , Measures of Central Tendency, Probability	Chapter 5	Annotated Bibliography(10 pts) Websites
Friday, September 19	Ogden Elementary School		
Friday, September 26	V. Geometry: Properties of Two and Three-Dimensional Shapes	Chapter 2	Test I (10 points)
Friday, October 3	VI. Geometry: Transformations and Symmetry		Data Project (20 points)
Friday, October 10	VII. Geometry: Visualization and Spatial Reasoning		
Friday, October 17	Lesson Plan Preparation for October 27th Math lessons		
Friday, October 24	VIII. Measurement – The Measurement Process and Linear Measurement	Chapter 1	Math Lesson Plan (5 pts)
Friday, October 31	IX. Measurement – Area, Perimeter, and Volume		Video/Reflection of lesson (5 pts each)
Friday, November 7	X. Measurement: Weight, Time, and Temperature	Chapter 4	
Friday, October 14, 21	Field Experience – Ogden (7:15 – 3:30)		
Wednesday, December 3	WebQuest Artifact Presentations		WebQuest (15 points) Test II (10 points)

Watson School of Education Standards of Professional Conduct
http://www.uncw.edu/ed/advising/documents/StandardsofPC.pdf

Cell Phones, PDAs, Laptops
****Please make sure you mute your cell phone before class**
Please silence your cell phone and do not make calls, access applications or text during class. If you have a personal, urgent matter for which you need to be on call, please let me know in advance.

Zero Tolerance Policy
UNCW practices a zero tolerance policy for violence and harassment of any kind. For emergencies contact UNCW CARE at 962-2273; Campus Police at 962-3184; or Wilmington Police at 911. For University or community resources visit: http://www.uncw.edu/safe-relate/campusResources.htm. Violence prevention information and resources are available at http://www.uncw.edu/safe%2Drelate/.

UNCW Diversity Statement
As an institution of higher learning, UNCW represents a rich diversity of human beings among its faculty, staff, and students and is committed to maintaining a campus environment that values that diversity. Accordingly, the university supports policies, curricula, and co-curricular activities that encourage understanding of and appreciation for all members of its community and will not tolerate any harassment or disrespect for persons because of race, gender, age, color, national origin, ethnicity, creed, religion, disability, sexual orientation, political affiliation, marital status, or relationship to other university constituents: http://www.uncw.edu/diversity/. **Seahawk Respect Compact:** http://www.uncw.edu/diversity/src.html

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http://www.uncw.edu/policies/04-100-academichonorcode.htm

Special Needs
If you require accommodation for any special needs on a regular basis or on a one-time basis please notify me before class. Students with Disabilities information and resources available at http://www.uncw.edu/stuaff/disability/

The University Learning Center
DePaolo Hall 1056 & 1003, first floor, 910.962.7857
http://www.uncw.edu/ulc
The University Learning Center's (ULC) mission is to help students become successful, independent learners. Tutoring at the ULC is NOT remediation: the ULC offers a different type of learning opportunity for those students who want to increase the quality of their education. ULC services are free to all UNCW students and include the following:
-- Writing Services http://www.uncw.edu/ulc/writing/index.html