

WATSON SCHOOL OF EDUCATION
DEPARTMENT OF ELEMENTARY, MIDDLE LEVEL AND LITERACY EDUCATION
EDUCATION 322 (Sections 003)
Foundations of Number and Algebraic Reasoning (K-6)
Fall 2010

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Office Hours: By request

Course Description:

Prerequisites: EDN 301 and six semester hours of appropriate mathematics. Co-requisite: EDNL 330. Focus on the curriculum, materials, and methods appropriate for the teaching of mathematics for the kindergarten through sixth grade level. Field experience required.

Conceptual Framework:

The Watson School of Education strives to develop highly competent professionals to serve in educational leadership roles. EDN 322, The Teaching of Mathematics (K-6), supports this framework through discussions, class activities, readings, field experience, projects and evaluations. These projects afford students the opportunity to develop the following competencies:

- ✓ Informed data driven decision making
- ✓ Reflective practice
- ✓ Commitment to ethical and professional standards
- ✓ Knowledge in academic content and pedagogy
- ✓ Technology integration
- ✓ Ability to meet needs of diverse learners
- ✓ Knowledge and use of appropriate communication strategies

Individual student growth in these areas will result in educational practice that positively impacts learning. See <http://www.uncw.edu/ed/pdfs/cf.pdf> for a more in-depth information and discussion.

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 an understanding of the mathematical content related to number and operations and algebraic reasoning which underlies the mathematics taught at the K-6 level.
2. compare the NCTM Standards with mathematics curricula and instruction at the K-6 level.
3. relate selected concepts in learning and child development to mathematics instruction.
4. use informal diagnostic techniques in planning instruction.
5. identify commercial, environmental, and technology-based materials useful in the teaching of mathematics.
6. integrate mathematics with other elementary subjects.
7. generate instructional sequences on topics such as:

classification	rational counting	estimation
seriation	numeral formation	basic fact mastery
patterning	place value	whole number algorithms
concept of number	basic operations	
rote counting	fractions	
8. design activities to help children learn facts, acquire skills, develop concepts in mathematics and use calculators

appropriately in applying concepts.

9. modify mathematics curriculum and instruction to meet individual needs.
10. apply the criteria of a good K-6 mathematics program according to the North Carolina Department of Public Instruction (NCDPI) and the National Council of Teachers of Mathematics (NCTM).

Course Materials:

- EDN 322 Foundations of Number and Algebraic Reasoning (K-6), Pearson Custom Education Text. ISBN 9780558602550 (REQUIRED)
- Carpenter, Thomas P. Thinking Mathematically. ISBN 9780325005652 (REQUIRED)
- Course packet. EDN 322, The Teaching of Mathematics K-6 (REQUIRED, PDF will be provided at no charge)
- Task Stream Account (REQUIRED)
- Mini DV Tapes, Access to a Digital Video Recorder – Curriculum Materials Center
- Student membership to NCTM – www.nctm.org (OPTIONAL)

Effort

Successful completion of EDN 322 requires active participation, thoughtful completion of assignments, and careful consideration of all assigned reading. It is extremely important that you are actively involved in this course each week. If you are not able to fully participate or complete assignments in a timely fashion, please let me know as soon as possible. Tests will cover all assigned readings and presentations.

COURSE OUTLINE

Week Ending	Module #/Topic	Pearson	Carpenter
August 18	I. Course Introduction		
August 23	II. The NCTM Standards/Problem Solving	1-3	
August 25	III. Theories of Learning/Planning/Assessment Conceptual and Procedural Knowledge	4-5	
Aug. 30th-Sept. 1st	IV. Early Number Sense and Whole Number Operations	6-7	
Sept. 8th	V. Basic Facts and Place Value	8-9	
Sept. 13 th , 15 th	VI. Computation and Estimation; Addition	10-11	
Sept. 20 th , 22 nd	VII. Computation and Estimation; Multiplication and Division	12-13	
Sept. 27 th , 29 th	VIII. Fractions	15-16	
Oct. 6 th	IX. Fraction Algorithms and Decimals/ <i>Test I</i>	17	
Oct. 11 th and 13 th	X. Early Components of Algebraic Reasoning (Pre-number Concepts: Classification & Patterning)	14	
Oct. 18 th and 20 th	Cont'd		
Oct. 25 th and 27 th	XI. Patterning (con't)		1
Nov. 1 st and 3 rd	XII. Equality/Problem-solving Processes (Reversibility, Flexibility and Ability to Generalize); Relational Thinking		2-4
Nov. 8 th and 10 th	XIII. Concept of Variable		5-7
Nov. 15 th and 18 th	XIV. Properties and Operations; Constant and Non-constant Rates of Change; Concept of Function		8-9
Nov. 22 nd /Nov. 29 th , Dec. 1st	XV. Functions (con't) / <i>Test II</i>		10

Instructor Availability:

Office hours are not scheduled (see page one of this syllabus). Contact can be made by e-mail or phone.

Disability Services:

**If you are a person with a disability and anticipate needing accommodations of any type in order to participate in this class, you must notify Disability Services (962-7555), provide the necessary documentation of the disability and arrange for the appropriate authorized accommodations. Once these accommodations are approved, please identify yourself to me so that the accommodations can be implemented.

Grading:

During this course, you can earn a total of 515 points. All tests and assignments are listed below. No extra projects will be accepted. Please keep a running total of the points you have earned on this syllabus. Grades will be determined as follows:

A = 479-515 points	B- = 412-426 points	C- = 361-375 points
A- = 464-478 points	C+ = 397-411 points	D = 309-360 points
B+ = 448-463 points	C = 376-396 points	F = below 309 points
B = 427-447 points		

TESTS and QUIZZES

<u>Test I</u>	Date: 10/6	100 points	_____
<u>Test II</u>	Date: 11/22	100 points	_____

The first test will focus on concepts and methods for teaching K-6 Number and Operations concepts. Test II will focus on concepts and methods for teaching K-6 Algebraic Reasoning. All class discussions, handouts, and assigned readings may be included. Because it is an unsuccessful strategy, cramming is not recommended.

<u>Quizzes</u>	Due: ongoing	100 points	_____
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Eight (8) quizzes will be given throughout the semester. The lowest two quiz scores will be dropped and the other six quizzes will be averaged to reflect a score out of 100 points. Quizzes will focus on the topic covered during that particular week and will help you prepare for Tests I and II.

PROJECTS

Detailed descriptions of the following projects and grading criteria will be provided in class discussions. All materials submitted must be well-edited and typed. Projects which do not meet these standards will not be graded. All assignments are due at the beginning of class. Grades on late projects will be decreased 10% for every day the assignment is late.

		<u>Possible Points</u>	<u>Attained Points</u>
1. <u>Math Autobiography</u>	Due: August 23	20 points	_____
In about 2 pages, describe your previous experiences as a mathematics student in elementary school, in secondary school and in college. Discuss what material was covered, how it was taught, and how you felt about it. Then discuss how you feel about taking this course and about <u>teaching</u> mathematics. This paper will be completely confidential and will not be returned. Put your name on a cover sheet <u>only</u> .			
2. <u>Self-Evaluation using the Performance Evaluation Scale</u>	Due: September 8 and November 29	10 points (5 points each, pre- and post-)	_____
3. <u>Textbook Review</u>	Due: September 15	20 points	_____
4. <u>Number Facts Assessment</u> or <u>Piagetian Task</u>	Due: October 11	20 points	_____
5. <u>Algebraic Reasoning Assessment</u>	Due: November 18	20 points	_____
6. <u>Math Trail Project</u>	Due: December 1	50 points	_____
7. <u>Videotaping</u>	Due: October 25	40 points	_____

During the course of the semester, you will submit one videoclip of your tutoring from EDNL 330. The lesson plan used for the videotaped session should accompany the videoclip as well as a reflective paper.

8. <u>Discussion Board</u>	Due: ongoing	15 points	_____
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In an effort to increase discourse outside of class, discussion questions will be posted online. As a student in EDN 322, you are expected to read all postings and share your own experiences, thoughts and ideas. A minimum of three *high-quality* postings for each topic/conference (one initial response and two replies) is expected of each student for each discussion forum.

9. <u>Participation in Class Tasks</u>	Due: ongoing	20 points	_____
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Each week, you will be engaged in solving problems and participating in short assignments that should further your understanding of the teaching of mathematics. You should participate in each of these assignments. You may earn up to

15 participation points for your involvement in this work.

9. Field Experience

Successful completion of the field experience requires attendance at EDNL 330 class meetings and completion of tasks as outlined in the EDNL 330 syllabus. Tutor one child for 10 hours using a hands-on approach. Lesson plans must be approved by the Lab instructor before each session and must include the use of developmentally appropriate manipulatives. Tutoring sessions should begin as soon as possible.

INTEGRATION OF TECHNOLOGY

TaskStream:

The Watson School of Education requires that all education majors enrolled in methods courses maintain an active account on TaskStream. You are asked to maintain that account for the duration of your program with the Watson School of Education (www.taskstream.com). Students in these courses will use TaskStream to maintain a Professional Development Portfolio. This portfolio includes evidence of your work to demonstrate progress toward meeting exit requirements and professional standards.

Performance Evaluation Scale:

You will be introduced to the Performance Evaluation Scale (PES) which is used during the internship. You will be asked to do a self-evaluation using these criteria. You will also identify your current areas of strength and what areas of growth you want to focus on at this time. You may access the PES from the following URL:

http://people.uncw.edu/hillk/322/PES_2008.doc

Academic Honor Code:

Adherence to standards of professional conduct is expected in EDN 322. Please familiarize yourself with the requirements of the UNCW Academic Honor Code and the Watson School of Education Standards of Professional Conduct. These documents can be found in the course packet and on the course webpage.