

**WEBSTER UNIVERSITY
COURSE SYLLABUS**

NOTE: The syllabus is subject to change in response to student needs and topics of interest that emerge.

ECED 5830 Topics in Early Learning: Math for the Young Child

Dr. Cheryl Breig-Allen
Wednesday 5:00-9:00

Summer, 2005
The College School

COURSE DESCRIPTION (Student Focus, Rationale, Scope)

Students explore ways to support the young child's construction of knowledge in regard to number. The educational implications of Piaget's theory and related research are examined. The course focuses on children's mathematical learning in pre-kindergarten through third grade.

LEARNING OUTCOMES (Goals and Objectives)

The student will:

1. examine personal beliefs about the teaching and learning of math.
2. develop interest, positive attitude, curiosity and creative thinking about math.
3. examine how children construct their understanding of mathematical concepts.
4. analyze the role of teaching mathematics with a focus on problem solving.
5. explore elements of a comprehensive mathematics curriculum.
6. organize a classroom environment that supports children's learning in mathematics.

TEXTS

Copley, J.A. (ed.) (1999). Mathematics in the early years. Reston, VA. National Council of Teachers of Mathematics.

Additional readings will be distributed during class sessions.

Audio-visual: Video and slides will be used to illustrate and examine concepts and strategies presented in class.

COURSE REQUIREMENTS

1. Mathematics Learning Center (Due 7/27)

Students will work in peer groups to design and organize a learning center with at least two activities focusing on each of the **mathematical strands**.

- measurement
- probability and statistics
- geometry
- logical reasoning
- patterns, functions and algebra
- number

for a group of children

- **pre-k-kindergarten** or
- **primary grades 1-3**

Peer groups will make collaborative decisions as to what math materials should be purchased, considering cost as well as purpose. Time for this group work will be integrated into class format and information will be shared with the class on the last day.

Each center will include

- Diagram of organization, management/rotation, and storage. Make sure the procedures for removing, using, and replacing materials are clearly understood by the children.
- Activity Plans
Title:
Objective/Skill
Materials (purchased/include price and description; recycled materials)
Naturalistic and Informal Activities
Structured Activities (list procedural steps)
- Six (at least) children's books that support learning of specific math concepts
Write a description of each one and tell how it would be used with children.
- Six (at least) math finger plays, songs and or rhymes
- Technology/computer software suggestions with reviews and evaluations
- Learning games
Design a math game utilizing developmentally appropriate methods of introducing math concepts. The games should be flexible so they can continue to support children's growing math skills and be used with different age groups.
- Assessment Strategy (How will you evaluate proficiency level and by what means?)
- Instructional Resource (books, journal articles, internet websites and catalogs)

2. Center Reflection Paper

Students will submit a reflection paper using the following framework to reflect upon their work with the peer group. Resources (text, articles, videos) from class and outside research will be integrated throughout the paper. Papers will be evaluated in terms of the quality of thought, organization, and integration of resources. Final drafts of individual papers will be brought to class for peer review.

Reflection Paper Framework

Goals/Hypotheses/Questions:

- What do you intend for children to learn? What will they gain from this experience?;
- What questions do you have about children's learning processes and thoughts that might be answered through this experience?; and
- Identify potential learning outcomes in a more specific way through the statement of objectives, concepts and skills learned. Include information from the learning cycle.

Projected Plans, Strategies, and Procedures:

- Selection and organization of materials, tools, and containers to be used by children;
- Organization and preparation of the environment (Consider time, flow of activity, organization of furniture arrangement of teacher and children in space, etc.);
- Preparation of children and/or parents (e.g., note sent home about upcoming study or a note to request that the child bring something or do something in preparation for the experience);
- Selection of children who will participate; How will the children participate Provide opportunities for cooperative problem solving.
- Questions, comments, or memories that you might share with children to help them reflect and reconnect with prior learning or experiences that are related to the experience at hand;
- Procedures.

Plans for Documentation and Assessment:

- What kinds of documentation will enable you to examine behavior and achievements related to the goals, hypotheses, questions, and/or intended learning objectives?; How will the children's progress be evaluated?;
- What methods of observation would be most useful and feasible (e.g., running records, time sampling, interviews, video recording, audio recording, or photographs)?;
- What tools/technology is needed? (e.g., video camera, tape recorder, paper and pencil, clip boards, still camera)?;
- Who will collect or record the observations?; and
- How will you coordinate your plans with other teachers?

Implications for Future Work with These Children and Future Teaching Situations:

- Discuss possible implications for future work with these children.
- Integration with other curriculum projects

3. Participation and Leadership in Facilitating Class Discussion on Reading Assignments.

Students will choose chapters from text and prepare to lead class discussion.

ATTENDANCE

Regular attendance will be taken and penalties imposed for excessive absences.

WRITTEN WORK

Assignments are due at class time on the date specified. Failure to turn in a paper on time can result in a penalty of one grade. Assignments are expected to be free of mechanical, typographical, grammatical, and spelling errors.

READING AND CLASS PARTICIPATION

Reading assignments will be given for each class. Chapters from texts should be read prior to class discussion on that topic. Students are responsible for all materials for all materials as assigned. Class participation is strongly encouraged as we all have experiences from which others can learn. We need to build and construct our knowledge as we proceed through this course.

Rubric for Reflection Paper

Superior A or A-	Meets Expectations B+, B or B-	Meets Minimal Expectations C+ or C	Unacceptable C- or D
<ul style="list-style-type: none"> • Takes initiative to exceed minimum requirements and uses multiple methods of assessment that capture critical moments in mathematical learning. • Engages in strong collaborative reflection and documentation of interpretation and analysis of mathematical materials and activities. • Explores principles, theory and relevant research addressed beyond the assigned readings and class materials. • Considers the complexities of family and community context when drawing conclusions and/or developing center activities and assessment strategies. • Clarity of writing, paragraphing, transitions and sentences make papers easy for the reader to follow. Attractive and appropriate APA manuscript format. 	<ul style="list-style-type: none"> • Meets requirements of developmentally appropriate activities and implements basic assessment strategies to study and support the mathematical development of young children. • Evidence of some collaborative engagement. • Explores principles, theories and relevant research addressed through assigned readings and class materials. • Draws from observations and theoretical framework to inform center activities and assessment strategies. • Absence of usage and grammatical errors; accurate spelling; careful proofreading; follows APA manuscript format. 	<ul style="list-style-type: none"> • Uses few appropriate connections made to assigned readings or class materials. • Evidence of some attempts to collaborate but not well documented. • Content supported by adequate theoretical argument and some details to support. • Adequate explanation of thinking. Logical and clear arrangement of basic ideas for center activities and assessment strategies. • Papers are readable but lack smooth flow of ideas. Required length of papers not met. Required number of references not met. Many errors in use of APA format. 	<ul style="list-style-type: none"> • Activities and assessment strategies lack detail, clarity and focus. Ideas not developed; lacks logic of support; confusing does not make sense. • Collaborative contribution not documented or fails to meet requirements. • Unclear thinking and/or unsubstantiated arguments. Few appropriate connections to text or class handouts. • Center activities or assessment strategies are not supported by theory, research and observations. • Spelling and grammatical errors are numerous enough to interfere with understanding. Does not follow APA format.

COURSE CALENDAR

- 6/8 Introduction to course, content, and expectations. Get acquainted and develop a profile of the class as individual and group learners (questions and concerns). Examine students' personal beliefs about the teaching and learning of math. Discuss implications of early learning experiences with math and their influences on current classroom practices. Discuss the historical, theoretical and social aspects of early childhood mathematics curriculum
- a perspective on arithmetic
 - how children learn mathematics
 - organizing the environment for problem solving
- Assignment: Read Chapters 1-4.
- 6/15 Mathematics for the young child
Continue discussion of classroom design to support math learning
Discuss the importance of children's play
Developing math games, math centers, project work.
Discuss Chapters 1-4.
Assignment: Read Chapters 5, 10, 14, 16, 20 and 22.
- 6/22 Organizing an instructional program
Discuss Chapters 5, 10, 14, 16, 20 and 22.
Assignment: Read Chapters 6, 7, 8, 11 and 13.
- 6/29 Mathematical strands
- measurement
 - probability and statistics
 - geometry
 - logical reasoning
 - patterns, functions and algebra
 - number
- Discuss Chapters 6, 7, 8, 11 and 13.
Assignment: Read Chapters 9, 12, and 21.
- 7/6 Implications of mathematical programs
Assessment
Scope and sequence of various mathematics curricula
Students will bring in an example of a math program currently be used in schools
Discuss Chapters 9, 12 and 21.
Assignment: Read Chapters 15, 17, 18, and 19.
- 7/13 Examination of music, storytelling, drama, geometry, patterning, sorting and graphing, estimating, counting and comparing activities teachers can use to support children as they work together making responsible choices as the grow in math.
Discuss Chapters 15, 17, 18 and 19.
Assignment: Read Chapters 23, 24, 25 and 26
- 7/20 Further problem solving possibilities
Discuss Chapters 23, 24, 25 and 26
Bring final drafts of reflection papers for peer review.

7/28 Mathematics: Pre-kindergarten through primary perspectives
Students will share papers and activities with class.
Center reflection papers due.

