

**Auburn University Course Syllabus  
SPRING 2014**



<b>Course Number:</b>	CTEC 7276/8276
<b>Course Title:</b>	Theory-Based Problems: Mathematical Thinking
<b>Credit Hours:</b>	3 semester hours
<b>Prerequisites:</b>	None
<b>Co-requisites:</b>	None

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**\*Email communication is best for more prompt response; email for appointment during or outside of office hours**

Required Text:

**I recommend that this semester as one of your tasks join NAEYC as a member of this class:**  
National Association for the Education of Young Children: <http://www.naeyc.org>

Caldwell, J. H., Karp, K., Bay-Williams, J. M. (2010). *Developing essential understanding of addition and subtraction for teaching mathematics in prekindergarten – grade 2*. Reston, VA: The National Council of Teachers of Mathematics, Inc.

Dougherty, B. J., Flores, A., Louis, E., & Sophian, C. (2010). *Developing essential understanding of number and numeration for teaching mathematics in prekindergarten – grade 2*. Reston, VA: The National Council of Teachers of Mathematics, Inc.

Krasa, N., & Shunkwiler, S. (2009). *Number sense and number nonsense: Understanding the challenges of learning math*. New York: Psychology Press.

*Recommended texts:*

Whitin, P., & Whitin, D. J. (2000). *Math is language too: Talking and writing in the mathematics classroom*. Urbana, IL: National Council of Teachers of English (NCTE).

## **COURSE DESCRIPTION**

In-depth exploration of a problem related to the thought, writings, and research that form the theoretical foundations of constructivist approaches to early childhood education.

## **COURSE OBJECTIVES**

Upon completion of the course, students will be able to:

1. Examine the contributions of recent research in understanding the challenges of learning math and cognition.
2. Identify the tasks, observations, and questions used by researchers to examine learning differences in cognition related to math and reading.
3. Explore children's ideas, teaching and learning, thought and language suggested by research by recording observations of children.
4. Identify theoretical and research questions stemming from the works of researchers on early learning and teaching that may yet be unanswered and are appropriate problems for future research.
5. Draw on theoretical perspectives and research to discuss implications for instruction and educational practices in early childhood and throughout schooling.
6. Plan experiential activities based on the research and discussion.

## **USEFUL WEBSITES**

**You are required to join NAEYC as a member of this course; you will otherwise be asked to go to these other websites for resources to complete other assignments**

National Association for the Education of Young Children: <http://www.naeyc.org>

National Council of Teachers of Mathematics (NCTM): <http://www.nctm.org>

National Science Teachers Association (NSTA): <http://www.nsta.org>

National Council of Teachers of English (NCTE): <http://www.ncte.org>

Alabama Math, Science, and Technology Initiative: <http://www.amsti.org>

Alabama State Department of Education: <http://www.alsde.org>

## **AUBURN COLLEGE OF EDUCATION-CONCEPTUAL FRAMEWORK**

Competent

Competent professionals demonstrate the knowledge and skills needed to facilitate the learning of the individuals they serve. Their competence enables them to model and promote active, collaborative, and ongoing learning. Their efforts are enhanced by their abilities to foster learning communities that are safe, stimulating, and enriched with diversity; engage in reasoned and purposeful decision making; and implement their professional practices in proactive, flexible, and self-regulating ways.

We recognize that the development of professional competence is linked to levels of preparation and experience. We also acknowledge that competence continues to develop over the course of an entire career.

### Committed

Committed professionals make reasoned decisions based on thoughtfully constructed values. As a College, we strive to nurture values that support the learning of all people, honor diversity, protect the integrity of learning, and expand the scholarship of our professions. We view these values as professional dispositions, and we define them as filters for responsible decision-making. Our College emphasizes the conscious development of commitments related to professional responsibilities and ethics, collaboration, diversity, and intellectual vitality.

### Reflective

We choose to frame reflection as a critical and pervasive habit of mind that permeates and fuels the ongoing expansion of competence and the continued development of reasoned commitments. Reflective professionals subject their own competencies and commitments to continuous scrutiny as they systematically monitor the impact of their professional practices on the individuals they serve and make adjustments as needed. Thoughtful reflection emphasizes reviewing and analyzing past practices in ways that influence and improve future practices. This stance inspires self-initiated professional growth and results in increased capacities for addressing the complexities and dilemmas situated within the work of educational and human services professionals.

## **COURSE REQUIREMENTS**

Specific criteria in rubric format will be discussed as due date approaches for items 1-5.

1. **Discussion embellishment (30 Points):** (a) Each class member will bring to each week's online discussion an outside resource and discussion question relative to the week's topic. As each participant gathers more resources related to her expert topic, those may serve as outside resources. Questions for discussion should be posted online no later than the assigned date for the topic; (b) respond to a minimum of two other class members.
2. **Two clinical interviews & analysis (30 points):** Each person will conduct two 5-10 min. clinical interviews (following Piaget's method of interviewing) – once with one child, and a second time with a child of different age, gender, or ability in math. The manner in which the children are screened and evaluated on their mathematical thinking will be discussed online as well. The product for this assignment will be a paper, including the transcripts from the interviews and an analytical commentary, relating what we are learning in this class from our readings, others' outside resources, expert topics, etc., and related to these interviews.

3. **Expert topic paper/presentation (30 points):** Choose a topic by week 2 that you will become expert in over the semester. Each member will write a 10-12-page paper on the topic and present the findings in class. A minimum of 10 resources, including 5 empirical articles from refereed journals, is required. You will present this information digitally to your peers. Follow APA style for writing the paper. The Writing Center is an excellent resource.
4. **Participation and collaboration (10 Points):** All students are required to participate in all online discussions, be punctual with deadlines, and be active in adding resources to the class website. Students are also expected to collaborate when it is appropriate to do so, for example when looking up resources and running across one that may be of interest to someone else.
5. **Evaluation project – 8000 level course only (20 points):** Choose or create an evaluation tool that adds information to the profile of a child you have observed. Explain in your written report how you chose the evaluation tool, what research you could find on its use, the outcome of the child's performance on the tool, and how that compares to what you learned about the child from the clinical interview you conducted.

## GRADES

Requirements and Points	Grades
<ul style="list-style-type: none"> <li>➤ Discussion embellishment (30 points)</li> <li>➤ Two clinical interviews; paper (30 points)</li> <li>➤ Expert topic paper/presentation (30 points)</li> <li>➤ Participation &amp; collaboration (10 points)</li> <li>➤ Evaluation project – CTEC 8270 only (20 points)</li> </ul>	<p><b>7000 level course</b></p> <p>A = 100-90 points  B = 89- 80 points  C = 79-70 points  D = 69-60 points  F = 59 - 0 points</p> <p><b>8000 level course</b></p> <p>A = 120-108 points  B = 107- 96 points  C = 95-84 points  D = 83-72 points  F = 71 - 0 points</p>

## CLASS POLICY STATEMENTS

Participation: Students are expected to participate in all class discussions and participate in all exercises. It is the student's responsibility to contact the instructor if assignment deadlines are not met. Students are responsible for initiating arrangements for missed work.

Attendance/Absences: Participation is required for all online assignments, discussions, feedback on presentations and paired assessments. If an exam is missed (there are no exams in this course), a make-up exam will be given only for University-approved excuses as outlined in the [Student Policy eHandbook](#). Arrangement to take the make-up exam must be made in advance. Students who miss an exam because of illness need a doctor's statement for verification of sickness and should clear the absence with the instructor the day they return to class. Other unavoidable absences from campus (for any section of this class that is not online) must be documented and cleared with the instructor in advance. **Each unexcused absence** will result in 5 points deducted from the class

participation grade. **Tardy arrivals** will result in 2 point deducted from the class participation grade. If points from absences and tardy arrivals exceed the 20 points allotted for class participation, the points will be taken from the final total. **Three unexcused absences may result in a teacher candidate being dropped from the program.**

Accommodations: Students who need accommodations are asked to electronically submit their approved accommodations through AU Access and to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are needed immediately. If you have a conflict with my office hours, an alternate time can be arranged. To set up this meeting, please contact me by e-mail. If you have not established accommodations through the Office of Accessibility, but need accommodations, make an appointment with the Office of Accessibility, 1228 Haley Center, 844-2096 (V/TT). See <https://fp.auburn.edu/disability/faculty/syllabus.asp>

Honesty Code: The University Academic Honesty Code and the [Student Policy eHandbook](#) Rules and Regulations pertaining to Cheating and Plagiarism will apply to this class. See <https://sites.auburn.edu/admin/universypolicies/Policies/AcademicHonestyCode.pdf>

Professionalism: As faculty, staff, and students interact in professional settings, we are expected to demonstrate professional behaviors as defined in the College's conceptual framework. These professional commitments or dispositions are:

1. Creates a caring and supportive learning environment and encourages self-directed
2. Demonstrates behaviors that are consistent with the ideals of fairness and the belief
3. Demonstrates, models, and exemplifies a commitment to diversity
4. Engages in responsible and ethical professional practices (shows trustworthiness, nurtures professional relationships, maintains confidentiality
5. Demonstrates professionalism by being prepared, dressing professionally, communicating appropriately, and fulfilling attendance expectations
6. Shows respect for and cooperates with students, families, colleagues, and
7. Shows initiative and self-direction in classroom activities (e.g., organization and management of classroom, planning and implementation of instruction)
8. Follows policy regarding use of digital tools and models digital citizenship and responsibility (e.g., the appropriate use of social media)
9. Contributes to collaborative learning community, models and nurtures intellectual vitality, and demonstrates interest and enthusiasm for the profession
10. Accepts/acts on constructive criticism and suggestions in a professional way
11. Monitors and adjusts own professional dispositions as necessary
12. Reflects on and analyzes past practices to stimulate ongoing improvement for

\*Mobile Device Policy: Smartphone use or text messaging or unapproved iPad/Tablet or laptop usage during the class session is viewed as extremely unprofessional and will result in an automatic loss of 5 points of **Class Participation and Professional Behavior grade points** (under COURSE REQUIREMENTS) **for the first occurrence; additional points will be deducted for repeated occurrences.** It is best that phones, iPads, and laptops not be visible during the class session to avoid any misunderstanding of their use.

**Reading Assignments/Assignment Due Dates found on next 2 pages**

## Reading Assignments/Assignment Due Dates

*This calendar is subject to change based on the needs of the class, knowledge gained, and practice needed to master the concepts taught in this course. Dr. Love will make this determination and give adequate notice of any revisions made.*

Dates	Topic	Reading/ Assignments (Due)
Week 1	<b>Course Introduction; Community Building Activities</b>	<b>Syllabus</b>
Week 2	Introduction to Number Sense & Number Nonsense	<ul style="list-style-type: none"> <li>Read CHPT 1 <i>Number sense and number nonsense</i> (Krasa &amp; Shunkwiler, 2009) text</li> <li><b>Choose a topic from among those discussed in class and online to become expert on this semester</b></li> </ul>
Week 3	Thinking spatially: Number sense	<ul style="list-style-type: none"> <li>Read CHPT 2 <i>Number sense and number nonsense</i> (Krasa &amp; Shunkwiler, 2009) text</li> <li>Read NCTM's <i>Number &amp; Numeration</i> CH 1</li> <li>Articles TBA</li> </ul>
Week 4	Math & spatial skills	<ul style="list-style-type: none"> <li>Read CHPT 3 <i>Number sense and number nonsense</i> (Krasa &amp; Shunkwiler, 2009) text</li> <li>Read NCTM's <i>Number &amp; Numeration</i> CH 2-3</li> <li>Articles TBA</li> </ul>
Week 5	<b>The language of math: Speaking mathematics</b>	<ul style="list-style-type: none"> <li><b>Read CHPT 4 <i>Number sense and number nonsense</i> (Krasa &amp; Shunkwiler, 2009) text</b></li> <li><b>Present findings from first clinical interviews with children</b></li> </ul>
Week 6	Reading & writing mathematics  <b>Midterm</b> <b>10/5 is last day</b> to withdraw from the course with no grade penalty. "W" assigned.	<ul style="list-style-type: none"> <li>Read CHPT 5 <i>Number sense and number nonsense</i> (Krasa &amp; Shunkwiler, 2009) text</li> <li>Read NCTM's <i>Addition &amp; Subtraction</i> CH 1-2</li> <li>Articles TBA</li> </ul>
Week 7	The brain & conventional mathematics	<ul style="list-style-type: none"> <li>Read CHPT 6 <i>Number sense and number nonsense</i> (Krasa &amp; Shunkwiler, 2009) text</li> <li>Read NCTM's <i>Addition &amp; Subtraction</i> CH 3</li> <li>Articles TBA</li> </ul>
Week 8	More sharks in the mathematical waters	<ul style="list-style-type: none"> <li>Read CHPT 7 <i>Number sense and number nonsense</i> (Krasa &amp; Shunkwiler, 2009) text</li> <li>Articles TBA</li> </ul>



Week 9	<b>Solving problems: Executive functions</b>	<ul style="list-style-type: none"> <li>Read CHPT 8 <i>Number sense and number nonsense</i> (Krasa &amp; Shunkwiler, 2009) text</li> <li>Present findings from 2<sup>nd</sup> set of observations/interview</li> </ul>
Week 10	<b>SPRING BREAK</b>	<b>Spring Break</b>
Week 11	Reasoning	<ul style="list-style-type: none"> <li>Read CHPT 9 <i>Number sense and number nonsense</i> (Krasa &amp; Shunkwiler, 2009) text</li> <li>Articles TBA</li> </ul>
Week 12	What did you learn from NAEYC? Professional implications: Evaluation	<ul style="list-style-type: none"> <li>Read CHPT 10 <i>Number sense and number nonsense</i> (Krasa &amp; Shunkwiler, 2009) text</li> </ul>
Week 13	<b>Professional implications: Evaluation &amp; Teaching</b>	<ul style="list-style-type: none"> <li>Read CHPT 11 <i>Number sense and number nonsense</i> (Krasa &amp; Shunkwiler, 2009) text</li> <li>Present your expert topic/teaching implications</li> </ul>