Instructor: Beth Lloyd, Ph.D.
Office: School of Education, Health, and Human Performance, Room 227
Office Phone: 953-7432
Email: LloydB@cofc.edu
Office Hours: Wed: 9-11 am; Thurs: 12:30-3:30 pm; or by appointment
Email Hours: Mon: Latest check and response 4 pm

Course Description:
This course focuses on the alliance of factual knowledge, procedural proficiency, and conceptual understanding. The parallels of learner development and the progressive nature of mathematics content standards are explored. Teacher candidates will study the elements necessary to help PK-8 students achieve high-quality mathematics instruction.

More specifically, in accordance with SC State, Common Core, and National Standards, teacher candidates will explore numbers and operations, geometry, measurement, data analysis and probability, and algebra. Problem solving, reasoning, multiple representations, connections, and communication are stressed throughout the course coverage of these content areas, facilitating the development of deep conceptual understanding. At the successful completion of the course, teacher candidates will be equipped to teach their future elementary- and middle-school students in a variety of ways such that their students understand mathematics procedures and why mathematics concepts make sense.

Required Text:
  ❖ Hardcover (used hardcover: $75.00) and paperback available - purchase 4th Edition

  ❖ Available online at www.nctm.org (100-day free trial)

Recommended Text:
  ❖ Used copies available online for about $3.00 (good resource, but not drawn on in class)

Additional Sources: Additional readings and/or information will be drawn from, but not limited to, the following sources.


Course Requirements:

Demonstration of SOE Dispositions

Examples of how dispositions are evident are provided in italics.

- Belief that all students can learn, *participation and attitudes expressed about students and learning*
- Value and respect for individual differences, *interactions in class discussions and participation in group work*
- Value of positive human interactions, *participation in class and in group work*
- Exhibition and encouragement of intellectual curiosity, enthusiasm about learning, and willingness to learn new ideas, *participation in class and group discussions and performance on assessments*
- Dedication to inquiry, reflection, and self-assessment, *participation in class and group discussions; performance on assessments (especially the reading and course reflections assignments)*
- Value of collaborative and cooperative work, *thoughtful, constructive critiques of others’ work, participation in class activities*
- Sensitivity toward community and cultural contexts, *participation in class and group discussions, tolerating, discussing, and respectfully listening to differing points of view*
- Engagement in responsible and ethical practice, *performance on assessments, class attendance, and participation in group activities*
- Development of professional mastery over time, *performance over time in writing, thinking, and expression of knowledge*

Utilization of Computer Applications (Available in the CofC managed computer labs located in JC Long, Library, and other campus sites. If unfamiliar with these applications, set up a time for tutoring with me.)

- Internet
- Word processing
- OAKS

Completion of all assigned readings and assignments ON TIME.
See Course Assignments below for detailed descriptions.

Responsibility for ALL course content
Including lecture, text, outside reading, handouts, research, etc.

Responsibility for keeping up with grades and attendance
If you miss a class, ask a classmate for the missed assignments and notes.

Course Assignments:

Due dates for course assignments, as well as scheduled exams, are listed in the syllabus. Any changes will be announced in class. All assignments must be turned in during the class or to OAKS on the date due. Please make sure to pay attention to how each assignment should be submitted. If, for medical or serious personal reasons, an assignment is late, the instructor should be informed of the reasons. **DO NOT give assignments to School of Education personnel.**

All assignments must be typed and follow APA style guidelines.

Reading Reflection Journal

To maximize the development of how to teach mathematics, it is imperative that TCs engage in their readings. Some of the readings will be addressed in class, but due to the vast body of pertinent literature in this field, some of the topics covered in the out-of-class readings will not. Therefore, to ensure active engagement with the readings and maximum knowledge gained from this course, TCs will be responsible for reflecting on readings throughout the semester.
There are eleven reading reflective journal entries due throughout the course of the semester. Entries must be submitted to the dropbox in OAKS by the start of class on the date indicated on the daily schedule. Failure to submit on time will result in a loss of credit. Understanding that we all have very busy lives – some weeks more busy than others, TCs are allowed to omit one of the eleven entries without penalty.

Each entry should be labeled: “ENTRY #: CHAPTER or CHAPTER SECTIONS”
Each entry should have the following:
1. A succinct outline of each chapter.
2. Three quotations from each reading. Quotations should come from sections throughout the beginning, middle, and end of the readings, with no two coming from one section entirely.
3. Reflections on how each of the three quotations affects thinking about teaching, learning, and future practices. Reflections should include descriptions of “AHA!” moments, topics for which TCs are confused, how topics connect to the PK-5 classroom (refer to “Connections to the PreK-8 Classroom,” “Analyzing a Textbook Page,” and “Analyzing Student Work” segments), and topics that are of particular interest or concern to TCs.
4. One question per reading that ties in multiple main ideas from the chapter. The question should get at the heart of the main themes being conveyed in the reading.
5. A thorough answer to the question. TCs should be prepared to ask the question to the class and facilitate class discussion.

Like with all written assignments, TCs should follow APA formatting.

There will be some Warm Ups that require TCs to bring their questions and answers to class. TCs should note this so that they are fully prepared for class on these days. Participation points will be earned by those TCs who are prepared.

Homework Assignments
In addition to reading reflections, to maximize the development of mathematical thinking, it is important that the TCs engage in the actual mathematics being described both in their readings and in class. As such, throughout the semester, there will be content-based mathematics problems given from the class text, online resources, and materials provided during class. I will collect homework two times throughout the semester (due dates indicated on the schedule). Each collection should include the homework assignments assigned up to the due date. Depending on the number of problems per collection, I may spot check.

Tests: Midterm & Final
TCs will be expected to complete two tests: a midterm and final. Material on these summative assessments comes from (1) in-class lectures, discussions, and activities and (2) out-of-class readings and assignments. (Test dates are indicated on the schedule.)

Standards Project
TCs will sign up to examine one of the five NCTM Content Standards throughout the first three NCTM grade bands (Early Childhood Grade Band, covering PK-2; Elementary Grade Band, covering grades 3-5; Middle Grade Band, covering grades 6-8). TCs will also examine the SC and Common Core Standards that align with their NCTM Content Standard. In order to fully examine their standard, I expect TCs to:

- Familiarize themselves with the NCTM, SC, and Common Core Standards, understanding the expectations, objectives, indicators, etc. for each grade or grade band. (The language and breakdown is different for each set of standards.)
- Through this familiarization, articulate how children develop their mathematical thinking with regard to their specified content standard.
- Describe clearly how the standard translates into classroom practice. This is to be achieved in three ways: (1) reading Principles and standards, reviewing the Common Core Standards [http://www.corestandards.org/the-standards/mathematics](http://www.corestandards.org/the-standards/mathematics), and reviewing the SC State Standards.
Because “the mathematical Content and Process Standards…are inextricably linked,” describe how the Process Standards are integrated into implementations of the content standard (NCTM, 2000, p. 7).

Early Childhood TCs (PK – 2) must obtain three of the following four activities: (1) PK-K from a teacher; (2) PK-K from TCM; (3) 1-2 from a teacher; and (4) 1-2 from TCM

Elementary TCs (2 – 5) must obtain three of the following four activities: (1) 2-3 from a teacher; (2) 2-3 from TCM; (3) 4-5 from a teacher; and (4) 4-5 from TCM

Middle Grades TCs (6 – 8) must obtain three activities: at least (1) must come from a middle-grades teacher; at least (1) must come from MTMS; and the third activity can come from either another middle-grades teacher or another article from MTMS

The intent of this project is to familiarize TCs with the Standards, to help them understand how to implement standards into classroom practice (better understanding what makes a good standards-based, well-aligned assignment), and to help them understand how children develop their mathematical thinking from PK through grade five. Pragmatically, I want TCs to begin collecting detailed activities that span the Content Standards and grade bands so when they leave my class they do not have to start from scratch.

At the completion of our class coverage of a given content standard (number & operations, measurement, geometry, data analysis & probability, and algebraic thinking), the group which was assigned to that content area will teach a lesson on the development of student thinking from PK-8 in that given area. (In teaching this, they may consider having the class attempt to order particular expectations/indicators, ask questions about what classmates think fall within the content standard, provide a timeline of what is covered in each grade, etc.) TCs are expected to reveal how the NCTM, SC, and Common Core Standards differ in their descriptions of the development of mathematical thinking. During the lesson, the group will demonstrate four activities – (1) PK-1, (2) 2-3, (3) 4-5, and (4) 6-8 – exemplifying to their classmates the development of mathematical thinking within the given content area. Each of the group members should contribute equally in the facilitation of the lessons. This will require some out-of-class preparation. Each group member will have the opportunity to assess the contributions of the other group members. Both the demonstration and peer assessment will be figured into each TC’s Standards Project grade.

Note that while not indicated on the schedule, TCs should (1) work on this project throughout the semester and (2) read chapters three through six in the Principles and standards for school mathematics.

Presentation: See Schedule for Due Date; Shared Lessons: Due to OAKS 4/22; Write Up: Due 4/28

Participation and Attendance

Participation

During class, there will be a number of activities. TCs will be expected to participate in these activities (periodically collected at the completion of class) and in general class discussions. In order to earn credit for classwork activities and discussions, TCs must be present.

EDEE Attendance Policy

Excessive absences (i.e., more than 15% - approximately 5 hours/2 classes - may result in receiving a “WA/F.” Students will be tardy if they arrive in class within the first 20 minutes after class has started. Three tardies result in one absence. Students will be absent if they arrive after 20 minutes or if they leave class early. Regarding being tardy or having to leave class early, exceptions will be made on an individual basis, but students must speak with me about extenuating circumstances for such exceptions. Regarding
absences, if a student exceeds allowable absences due to extenuating circumstances beyond the student’s control, a panel of professors from that semester will review the circumstances and make a final decision. If a student exceeds allowable absences due to extenuating circumstances beyond the student’s control, a panel of professors from that semester will review the circumstances and make a final decision. **SNAP students**, if they wish special accommodations, must see the professor within the first two weeks of the course or as soon as they find out about potential accommodations if determined mid semester. **Athletes** who will miss class due to athletic events must see the professor within the first two weeks of the course and submit athletic schedule for the semester, identifying classes that will be missed. No other absences will be allowed for athletes who miss the maximum allowable absences due to athletic events.

**Written and Oral Communication**

TCs are expected to use correct grammar at all times. Points will be deducted on written assignments for grammatical errors. All references must follow the American Psychological Association (APA) Guidelines for Term Papers. Writing Lab is located on the first floor of Addlestone Library (Monday through Thursday 9:00 am to 9:00 pm and Friday 9:00 am to noon). Further, it is imperative that TCs use correct grammar in all oral communication, especially during field experiences. Classroom teachers, student peers, and I will collaborate to eliminate all oral grammatical errors, using an approach of constructive criticism.

**Evaluation**

It will be possible to earn 450 points during the semester. They will be distributed as follows:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Reflection Journal Entries (10)</td>
<td>4 points each, 40 points total (20%)</td>
</tr>
<tr>
<td>Homework Assignments (2 Collections)</td>
<td>10 points each, 20 points total (10%)</td>
</tr>
<tr>
<td>Midterm (1)</td>
<td>30 points (15%)</td>
</tr>
<tr>
<td>Final (1)</td>
<td>30 points (15%)</td>
</tr>
<tr>
<td>Standards Project</td>
<td>40 points (20%)</td>
</tr>
<tr>
<td>Presentation &amp; Posting</td>
<td>10 points</td>
</tr>
<tr>
<td>Shared Lessons/Activities on OAKS</td>
<td>5 points</td>
</tr>
<tr>
<td>Write Up</td>
<td>25 points</td>
</tr>
<tr>
<td>Participation and Attendance</td>
<td>40 points (20%)</td>
</tr>
</tbody>
</table>

**Evaluation Scale**

<table>
<thead>
<tr>
<th>Letter Grades</th>
<th>Percentage Range</th>
<th>Grade Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>91-100%</td>
<td>4.0</td>
</tr>
<tr>
<td>B+</td>
<td>89-90%</td>
<td>3.3</td>
</tr>
<tr>
<td>B</td>
<td>84-88%</td>
<td>3.0</td>
</tr>
<tr>
<td>C+</td>
<td>82-83%</td>
<td>2.3</td>
</tr>
<tr>
<td>C</td>
<td>77-81%</td>
<td>2.0</td>
</tr>
<tr>
<td>F</td>
<td>≤76%</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Respectful Conduct**

TCs are expected to be respectful and considerate of one another. Cell phones should be turned off while in class. Laptops should only be used in class if they are facilitating the development of mathematical thinking; if they appear to be a distraction, I will ask that they be put away.

**CofC Honor System**

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved. Incidents where the instructor determines the student’s actions are related more to a misunderstanding will handled by
the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student’s file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student’s transcript for two years after which the student may petition for the X to be expunged. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

Students should be aware that unauthorized collaboration--working together without permission--is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others’ exams, fabricating data, and giving unauthorized assistance. Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor.

Students can find the complete Honor Code and all related processes in the Student Handbook at http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php

ADA Accommodations
In compliance with the Americans Disabilities Act (ADA), all qualified students are entitled to “reasonable accommodations.” Any students requiring accommodations should contact the Center for Disability Services (953-1431) and provide me with documentation of needed accommodations within the first two weeks of the course or as soon as they find out about potential accommodations if determined mid semester.

Course Objectives
All teacher preparation programs in the College of Charleston’s School of Education (SOE) are guided by a commitment to the conceptual framework of “Making the Teaching and Learning Connection.” Three elements of teacher competency are fundamental to this framework; teachers must (1) understand and value the learner, (2) know what and how to teach and assess within a conducive learning environment, and (3) understand themselves as professionals. In addition, these competencies are foundational to the learning and assessments within this course, facilitating the development of knowledge, skills, and dispositions necessary for becoming an effective teacher.

Below are the specific end-of-course outcomes related to these teacher competencies. They are derived from the standards set forth by the National Council of Measurement in Education (NCME) and relate to those of the (1) School of Education (SOE), (2) National Council for Accreditation of Teacher Education (NCATE), (3) National Association for the Education of Young Children (NAEYC), and (4) National Middle School Association (NMSA). They, therefore, indicate the expectations for teacher candidates within the School of Education, early childhood teachers, elementary-grades teachers, and middle-grades teachers.

1. Teacher candidates (TCs) will develop the understanding of how students learn to construct mathematical ideas from the concrete early childhood experiences through the development of abstract thinking abilities in young adolescence.
   SOE I; NCATE 1; NAEYC 4b; NMSA 1.K1, 1.P2, 1.P4, 5.K4
2. TCs will articulate a vision of school mathematics that supports access of all students to a curriculum that emphasizes important mathematical concepts; effective and engaging research-based instructional practices; and high expectations with appropriate accompanying accommodations.
   SOE II, III; NCATE 2d, 3d; NAEYC 4b; NMSA 1.D3, 5.D7

3. TCs will convey an appreciation for the discipline of mathematics including its history and the contributions of diverse cultures to the field.
   SOE II, VII; NCATE 2d

4. TCs will articulate the knowledge that mathematics curriculum must be coherent and focused on important useful concepts that are connected within the discipline and across disciplines.
   SOE II; NCATE 2d, 2i, 3a; NAEYC 4b; NMSA 4.K2

5. TCs will recognize the importance of the role of student ideas, interests, and needs in the design, implementation, and evaluation of mathematically-based learning experiences.
   SOE I; NCATE 2d, 3a, 3d; NAEYC 4b; NMSA 3.K5, 3.D4, 4.P3

6. TCs will demonstrate an understanding of the need for a variety of instructional strategies to effectively address developmental, ability and learning style needs of PK-8 students exhibiting diversity in its many forms.
   SOE III; NCATE 4; NAEYC 1, 4b; NMSA 1.P5, 1.P10, 4.K3, 5.K2

7. TCs will develop the knowledge of, and dispositions that value, ongoing, systematic, formal, and informal assessment as an integral part of instruction that guides and enhances learning.
   SOE VI; NCATE 4; NAEYC 3, 4b; NMSA 1.P6, 5.K8, 5.D5, 5.P4, 6(all)

8. TCs will communicate about and through mathematics verbally and in writing using both everyday language and mathematical representations.
   SOE II; NCATE 2d, 3e; NAEYC 4b; NMSA 4.K4, 4.D4, 4.P5

9. TCs will demonstrate knowledge of the organization of the content standard areas of number and operations, algebra, geometry, measurement, data analysis and probability within the PK-8 mathematics curriculum as prescribed by the NCTM and the SC Standards.
   SOE II; NCATE 2d; NAEYC 4b; NMSA 4, 6.K5

10. TCs will demonstrate the value and integrative nature of the process standards of problem solving, reasoning, communication, connections, and representations within the PK-8 mathematics curriculum as prescribed by the NCTM and the SC Standards.
    SOE II; NCATE 2d, 3c; NAEYC 4b, 4c; NMSA 4, 5.K3, 5.P2, 6.K5

11. TCs will demonstrate competency in, and an understanding of the value of, a breadth and depth of mathematical knowledge and skills that extend beyond the level for which the TC is preparing.
    SOE II; NCATE 2d; NMSA 4.K1, 4.P2
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings &amp; Assignments to be completed for the given class</th>
</tr>
</thead>
</table>
| 1/13 | Course overview | Syllabus  
Beliefs about mathematics  
Doing mathematics  
Begin discussion of problem solving  
SC, Common Core, and NCTM Standards (45 min)  
Standard project sign up |
| 1/20 | Problem solving: Pizza problem  
Reasoning  
Communicating  
Sets and whole numbers | Read Ch. 1 and 2.1  
Reading Reflection Entry 1 Due |
| 1/27 | Warm Up: Review of *Everyday mathematics* procedures  
Addition and subtraction of whole numbers  
Multiplication and division | Read 2.2, 2.3, 3.3, & 3.4  
Read *Everyday mathematics* article  
Reading Reflection Entry 2 Due |
| 2/3 | Numeration systems: XMANIA  
Number sense, mental math, estimation, & rounding | Read 2.4, 3.1, & 3.2  
Reading Reflection Entry 3 Due |
| 2/10 | Integers (1 hr 15 min)  
Factors and divisibility  
Prime and composite numbers  
GCF and LCM  
Assessment – if time about 30 min is ideal | Read Chs. 4 & 5  
Reading Reflection Entry 4 Due: EC & EL reflect on Ch 4; Middle reflect on Ch 5 |
| 2/17 | Rational number system (50 min)  
Converting repeating decimals to fractions & Ch. problems (50 min)  
Addition and subtraction with fractions (50 min) | Read Chs. 6 & 7  
Reading Reflection Entry 5 Due: EC & EL reflect on Ch 6; Middle reflect on Ch 7 |
| 2/24 | Multiplication and division with fractions: lecture and group work | Catch up on readings: Chs. 1-7  
Find activities in *TCM* or *MTMS*  
Work on HW #1 |
| 3/3 | Midterm  
Fraction Activity Zones | Study for Midterm  
HW #1 Due in Class |
| 3/10 | **SPRING BREAK – NO CLASS** | |
| 3/17 | **The Development of “Number and Operations Thinking**  
Data Analysis | Number and Operations Standard Presentations Due  
Read Ch. 8  
Reading Reflection Entry 6 Due |
| 3/24 | Probability  
**The Development of “Data Analysis and Probability” Thinking** | Read 9.1, 9.2, & 9.4  
Reading Reflection Entry 7 Due  
Data Analysis and Probability Standard Presentations Due |
| 3/31 | Geometry: Origins of the Pyth. Thm.; Quadrilaterals (A, S, & N); Trianquad Concept Attainment Lesson | Ch. 10  
Reading Reflection Entry 8 Due |
| 4/7 | Geometry: Pike’s Thm (Geoboards); Tessellations Transformations  
**The Development of “Geometric” Thinking** | Ch. 11  
Reading Reflection Entry 9 Due  
Geometry Standard Presentations D |
<table>
<thead>
<tr>
<th>Date</th>
<th>Topics</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/14</td>
<td>Measurement</td>
<td>Ch. 12</td>
</tr>
<tr>
<td></td>
<td>The Development of “Measurement” Thinking</td>
<td>Reading Reflection Entry 10 Due</td>
</tr>
<tr>
<td>4/21</td>
<td>Algebra</td>
<td>13.1</td>
</tr>
<tr>
<td></td>
<td>The Development of “Algebraic” Thinking</td>
<td>Reading Reflection Entry 11 Due</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Algebra Standards Presentations Due</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shared Lessons Posted to OAKS</td>
</tr>
<tr>
<td>4/28</td>
<td>Final</td>
<td>HW #2 Due</td>
</tr>
<tr>
<td>4-7 PM</td>
<td></td>
<td>Study for Final</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standards Project Write Up Due</td>
</tr>
</tbody>
</table>