CTEE-7440-001 (Summer 2024)

**AUBURN UNIVERSITY**

**SYLLABUS**

1. **Course Number:**CTEE 7440

**Course Title:**Curriculum and Teaching Mathematics

**Credit Hours:**3 semester hours

1. **Term**Summer 2024

**Day/Time** Distance Learning Summer 2024

**Instructor**Dr. Megan Burton

**Office Address**5020 Haley Center

**Contact Information**[megan.burton@auburn.edu](mailto:megan.burton@auburn.edu)

**Office Hours**With appt. by email, phone, or ZOOM

1. **Texts or Major Resources:**

**Required Texts:**

1. **Huinker, D., Bill, V. (2017).**Taking action: Implementing effective mathematics teaching practices in K- Grade 5. Reston, VA: NCTM ISBN 9780873539692

**Additional References**

1. **AU IMG Canvas Help:** 334-844-5181 or See [Canvas HelpLinks to an external site.](http://www.auburn.edu/img/canvas/help/index.html)
2. **Canvas Tutorials:**See the video guides for how to use tools:

[Canvas Tutorial](http://guides.instructure.com/m/4210)

1. American Psychological Association (APA) (2010). *Publication manual of the American Psychological Association (APA) – Sixth Edition*. Washington, DC: APA. Or the electronic version can be downloaded at [APA BookLinks to an external site.](https://www.apa.org/pubs/books/4210512.aspx)

  2.**Course Description:**Teaching practices and re-appraisal of selecting experiences and content for curriculum improvement in (K-6) mathematics education.

\*If you are pursuing an Ed.S. or Ph.D. degree, please email the professor within the first 7 days of the course, to discuss increased expectations.

   3. **Student** **Learning Outcomes:**

**Goal**: To help participants enhance their teaching of mathematics and their understanding of certain mathematical concepts and skills. To support the development of professional educational leaders who can: 1) analyze critically theories on the teaching and learning of mathematics; 2) evaluate mathematics curriculum and instruction in light of current research on effective teaching.

**Objectives:**

1. Examine scholarly research concerning the teaching and learning of elementary mathematics.
2. Examine the various dimensions of mathematical curriculum, teaching, and learning
3. Evaluate current curriculum trends based on research, social issues, cultural issues, and discuss political trends that impact mathematics education.
4. Discuss conditions that foster a spirit of mathematical inquiry.
5. Adapt and expand activities and lessons from commercially produced materials;
6. Develop strategies for learners to express their mathematical understanding in multiple ways.

**Course Content Outline:**

*The use of technologies for distance learning delivery is essential. The instructor will respond to posts made by students within a week and will respond to emails within 48 hours. It is the student’s responsibility to ensure Canvas, the internet, and Auburn University email is working. Auburn University email must be checked once every weekday.*

***Schedule***

**Week 1** May 16-24 Introductions- 1 Teaching Practice: Establishing Goals. See Week 1 folder in modules for the document with details about assignments for the semester and specific assignments and links for week 1. (week 2 is packed with activities, so you may work ahead since week 1 is actually more than a week).

Read Taking Action 1-16, read [https://democracyeducationjournal.org/home/vol25/iss2/5/Links to an external site.](https://democracyeducationjournal.org/home/vol25/iss2/5/), & Watch the two videos in the weekly note (located in Module)

1. a) Post on **Discussion Board 1** about videos by Friday, May 24 at 11:59 am CST and respond to two peers by that same deadline.
2. b) Post a **Reflection 1** about readings due Friday, May 24 at 11:59 am CST

**Week 2**May 25-31 Establishing Goals & Number Talks

1. a) Post on **Discussion Board 2 by Friday at 11:59am**Select *one of the example Number Talk videos at*[http://www.insidemathematics.org/classroom-videos/number-talks Links to an external site.](http://www.insidemathematics.org/classroom-videos/number-talks)and answer the questions below:
2. What content was explored?
3. What understandings and/ or misconceptions do you see?
4. What ideas about future lessons, experiences, and/or problems do you have for the students in this experience (based on the responses of students)?
5. How are the teaching principles displayed in the example you viewed? What is missing (realizing this is one portion of a mathematics lesson)?
6. Share your experiences with Number Talks (it is ok if you don’t have experience, just share that) and your thoughts about Number Talks after watching the videos.
7. Respond to two peers

      If you are not already doing Number Talks, I encourage you to try this routine (but realize it takes time to develop the community). If you are unfamiliar with this routine and would like to read more resources a starting place might be links like: [http://www.mathmammoth.com/lessons/number\_talks.php Links to an external site.](http://www.mathmammoth.com/lessons/number_talks.php)and [http://mathsolutions.com/common-core-support/math-talk/resources/.Links to an external site.](http://mathsolutions.com/common-core-support/math-talk/resources/) Please note the actual routine procedures varies, depending upon the company or person describing it, but the main ideas are the same.

1. **Reflection 2 due Friday at 11:59am**Read Taking Action p.17-36 and complete all 4 ATL activities listed for the chapter as **–**
   1. **ATL 2.1 Respond to the 3 questions in the box before reading the rest of the chapter. Please leave your original “rough draft” thinking that arose from your initial conceptions. Then draw a line and write your thoughts after reading pg 19-21.**
   2. **ATL 2.2 Watch the video clip and respond to the 3 questions in the box on page 22**
   3. **ATL 2.3 Watch the video clip and respond to the 3 questions in the box on page 26**
   4. **ATL 2.4 Respond to the 3 questions in the box on page 30**
   5. **What specifically do you want to take away from this chapter to improve your teaching in the future?**

**Week 3** June 1-7 Implementing Tasks & Tools and Technology

* 1. Post on **Discussion Board 3** by Friday and respond to two peers by that same deadline.

Select one of the following free previously recorded webinars from NCTM at [https://www.nctm.org/online-learning/Webinars/List?status=recordingLinks to an external site.](https://www.nctm.org/online-learning/Webinars/List?status=recording). You will need to register, but it is free and available to members and nonmembers (some are not available to nonmembers, but the ones I am sharing are). The webinar will be approximately 1 hour.

* + 1. Oct. 2020 [Rough Drafts in Math: Going Beyond Getting Correct AnswersLinks to an external site.](https://www.nctm.org/online-learning/webinars/Details/502)
    2. Aug. 2020 [Place Value Understanding Through The Lens of An Elementary StudentLinks to an external site.](https://www.nctm.org/online-learning/webinars/Details/491)
    3. Mar 24: [Sense Making: Is It at the Core of Your Classroom?Links to an external site.](https://www.nctm.org/online-learning/Webinars/Details/599)
    4. Jun 22, 2021: [We Notice and Wonder What? Using Notice and Wonder as a Tool for Critical Reflection and EngagementLinks to an external site.](https://www.nctm.org/online-learning/Webinars/Details/555)
    5. Jun 08, 2021: [3-Act Tasks: Filling the Void of Mathematical Modeling in the Elementary GradesLinks to an external site.](https://www.nctm.org/online-learning/Webinars/Details/553)
    6. Oct 27, 2020: [Resources and Tools for Engaging Families in Fact FluencyLinks to an external site.](https://www.nctm.org/online-learning/Webinars/Details/518) (General Interest)
    7. Feb. 2024 [Becoming a Teacher of Math Modeling K-5Links to an external site.](https://www.nctm.org/online-learning/webinars/Details/601)

Share an outline of what was discussed and 4 questions, comments or take aways you have from the webinar.

* 1. Post a**Reflection 3 by Friday 11:59am–** Read Taking Action: Chapter 3 37-66. Complete the 4 ATL activities in the chapter and answer the questions in each box

**In order to be responsive to our needs, from Week 4 on these are a draft. After Week 1 the weekly discussions/ readings will adjust based on the needs of our class community.**

**Week 4** June 8-14 Building Procedural Fluency from Conceptual Understanding

**Post 4 by Friday:** Complete the Taking Action Box on page 95 of the readings and respond to two peers by that same deadline.

1. **Reflection 4 by Wednesday:**
   1. Read Taking Action Chapter 4 p. 66-96
   2. Complete the 4 ATL activities in the chapter and answer the questions in each box.

**Week 5** June 15-21 Pose Purposeful Questions Chapter 5 P 97-118

1. **Post 5 by Friday:** What are your strengths and struggles in questioning? Identify a math task that you might give to your students. State the learning goal, summarize the task, and then use the task to create a list of related questions using each of the 5 questioning types in the framework in figure 5.3 (pp. 102). It will be helpful to first *anticipate* likely student responses and misconceptions (see Smith & Stein’s practice 1, p. 30) and respond to two peers by that same deadline.
2. **Reflection 5 by Friday:**
   1. Complete the 3 ATL activities in the chapter and answer the questions in each box.

**Week 6** June 22-28 Chapter 6 Use and Connect Representations 119-144

1. **Post 6 by Friday:** What are some various ways you help students use AND connect representations? As some of you suddenly had to switch to distance learning, what are specific ways to support the use and connection of representations via distance education? Share 1-3 virtual manipulatives that can be useful in your grade level (provide a link to the specific manipulative, not a link to a list of apps and websites). Describe how you could use this and respond to two peers by that same deadline.
2. **Reflection 6 by Friday:**
   1. Complete the 3 ATL activities in the chapter and answer the questions in each box.

**Week 7** June 29-July 5 Facilitate Meaningful Discourse P 145-180/ Focusing on strengths

1. **Post 7 by Friday:** You have 2 choices
2. Visit: [https://www.nctm.org/profdev/half\_of\_a\_whole/Links to an external site.](https://www.nctm.org/profdev/half_of_a_whole/)

Download the task first and complete the handout. Watch the classroom video example (to answer the questions, you may need to watch it several times).

            Post:

1. What do you notice? Wonder? Think?
2. What do the learners need to know to be able to engage with this task?

* What opportunities to learn does the task provide?

1. Share ways the teacher supports her students’ learning of mathematics.
2. Connect specific teacher actions seen in the video to the *Effective Mathematics Teaching Practices.*
3. How does Ms. Brooks facilitate meaningful mathematics discourse?
4. Or watch the 1-hour webinar: Rehumanizing Schools: Rights of the Learner at: [https://vimeo.com/447665338Links to an external site.](https://vimeo.com/447665338) Share and outline from the talk you heard and something you notice, something you wonder about, and something that you want to apply in your classroom from this conversation.

1. **Reflection 7 by Friday:**
   1. Complete the 4 ATL activities in the chapter and answer the questions in each box.

**Week 8** July 6-12 Elicit and Use Evidence of Student Thinking P 181-211

1. **Post 8 by Friday:** Review the video “My Favorite No: Learning From Mistakes” ([My Favorite No (Links to an external site.)Links to an external site.](https://www.youtube.com/watch?v=srJWx7P6uLE)[A black and grey play button

   Description automatically generated](https://www.youtube.com/watch?v=srJWx7P6uLE)[(Links to an external site.)Links to an external site.](https://www.teachingchannel.org/videos/class-warm-up-routine)).  Choose a common student error and create a “favorite no.” Why is this common error useful to know?
2. **Reflection 8 by Friday:**
   1. Complete the 5 ATL activities in the chapter and answer the questions in each box.

**Week 9** July 14-20 Support Productive Struggle P 213-241

1. **Post 9 by Friday:** [Reflection 7](https://auburn.instructure.com/courses/1238980/assignments/8227011): *Mamadou-Half-Rectangle Solve the 3 questions listed below regarding the blue & green rectangle problem:*
   1. Students were asked:
2. What fraction of the big rectangle is shaded blue?
3. What fraction of the big rectangle is shaded green?
4. How much of the big rectangle is shaded altogether?

*Then watch the classroom scenario at the link (*[http://deepblue.lib.umich.edu/handle/2027.42/78024 (Links to an external site.)Links to an external site.](http://deepblue.lib.umich.edu/handle/2027.42/78024)*. You have to scroll down the page to access the video. Then analyze what you see using the 4 adult questions listed below:*

Answer the 4 questions below in regard to the 5-minute video:

1. How did the student's thinking differ from how you solved the problem?
2. What understandings and/ or misconceptions do you see from the student?
3. Realizing this is a summer camp experience, for students who are identified as struggling. What are your thoughts about how Dr. Ball is establishing community and expectations? What ideas about future lessons, experiences, and/or problems do you have?
4. **Reflection 9 by Friday:**
   1. Complete the 3 ATL activities in the chapter and answer the questions in each box.
5. **Exploration into Topic of Choice Due July 17-**Email Dr. Burton at least 48 hours in advance of the due date if you have specific questions that need to be answered for this assignment.

**Week 10** July 20- July 26 Pulling It All Together P 243

1. **Post 10 due Friday:**  Read: [http://www.dylanwiliamcenter.com/is-the-feedback-you-are-giving-students-helping-or-hindering/ (Links to an external site.)Links to an external site.](http://www.dylanwiliamcenter.com/is-the-feedback-you-are-giving-students-helping-or-hindering/) and the article in this module, “Never Say Anything a Kid Can Say.” Share 2 things that resonated with you from each of these. How do these relate to your own practice and experiences teaching? What is a ‘take-away’ you have from these?
2. **Reflection 10 due Friday:**
   1. Name 4 ideas that resonate with you from this chapter that you agree with (and why), disagree with (and why), or that you plan to implement in some form in your classroom (and why).
   2. Reflect on your work this semester. What is one specific goal you can set, based on things explored this semester, that can positively impact your classroom? Is there something Dr. Burton can do to support your accomplishment of this goal? What is a recommendation you have for this class in the future?

1. **Assignments/Projects:**
2. Discussion Posts- Each week students will post and respond to two peers to create a community atmosphere via distance learning. The posts should be made by**11:59 am CST Friday**.
   * (10 at 5 pts each = 50 points total) You will participate in 10 of the posts as participants, you will be the moderator for the remaining post. A detailed description of your responsibility as a participant is listed after class policies.

1. Reflections- (10 at 3 pts. each= 30 points total) Each week you will submit a reflection by ***Friday at 11:59am CST***. These may be based on videos, readings, or classroom experiences.

1. An exploration into Mathematical Issue, Practice, Curriculum, or Materials (12 pts)

Students will select an issue practice, curriculum, or material that they would like to explore in greater depth. They may choose to write a paper or create a blog, website, or add this to their own school webpage that provides information for parents, teachers, or students regarding this topic. This should be something new to the student, not something they already do in their classroom or a collection of resources already gathered. The paper and webpage have different expectations, so you are to choose the one that would be most useful to you. Topics include things such as:

* meeting needs of English Language Learners,
* Differentiation,
* Selecting Tasks,
* Utilizing Webb’s Depths of Knowledge in Mathematics,
* Formative Assessment,
* Parental Involvement/ Communication,
* Mathematical Practices,
* Questioning,
* Number Talks,
* Technology,
* Stations,
* Formative Assessment,
* RtI,
* Cooperative Learning,
* Fractions,
* Number Sense,
* Fluency,
* Measurement,
* Telling Time,
* Geometry,
* Project-Based Learning,
* Place Value, etc…

The ultimate purpose of this assignment is to allow students to gain a deeper understanding of a topic they are interested in and to gain a collection of resources from their peers. For either assignment option, students will use APA guidelines for headings, references, etc… If you need help finding the peer-reviewed articles in the AU library, you may use the handout provided on Canvas or contact a librarian. The rubric for this assignment may be viewed on Canvas. This may not be a topic about something you already feel you do well but should be something you want to learn more about and improve your practice.

Paper or Blog - This webpage or paper is written in essay form about an important topic in elementary mathematics. Your paper could be a description of a strategy, concept, or area of teaching mathematics that you would like to explore in further detail and try in your classroom. The article/blog will include a description of why this topic was selected, how it relates to your classroom (or future classroom), how it relates to learning and teaching, how to utilize, implement or support best practices on this topic, how the literature you read relates to the topic and the thoughtful reflection on the issue. You may try something and write about it (such as a new lesson, routine, etc..). You may include student work samples or photos (as long as student names and phases are not seen).

You will include at least 4 sources. This will include at least 2 peer-reviewed references (it is suggested that you use the library website to help you with this). Journals that meet this requirement are Teaching Children Mathematics and Young Children. These do not include articles found on a website that have not undergone a blind peer review such as: NCTM, Edutopia, Math Solutions, or Scholastic. It will also not include books. However, your third and fourth references don’t have to be peer-reviewed and can be a book or a website.

**OR**

Webpage-

This webpage could be an annotated list of materials on your topic (such as apps, books or websites on your topic that could help teachers, students or parents). If you have another idea for a webpage, please seek the professor's permission before proceeding. For an annotated list of resources, you will still need an introductory paragraph or two that describes for the reader why these sources are important and how they may be used. For this introduction, you will include a write up with information learned from at least 2 peer-reviewed sources that show how the items on the list support best practices. Your list must contain at least 10 items (children’s books, websites, or other resources related to your topic). Each item must contain 1-2 sentences that describe how the source. Be sure the reader knows the appropriate age range, the content of the book or webpage, who would use it, how it could be used and why it was selected.

The introduction will include at least 2 peer-reviewed references (it is suggested that you use the library website to help you with this). Journals that meet this requirement are Teaching Children Mathematics and Young Children. These do not include articles found on a website that have not undergone a blind peer review such as: NCTM, Edutopia, Math Solutions, or Scholastic. It will also not include books.

Please remember that the assignments you see on Canvas count as both the class time that would occur in a campus class and the homework that would be required for this course. Because this is a mini semester, the workload will be intense. Please don’t hesitate to contact me with any questions or concerns. I am here to support you as much as possible. I am available to meet on campus, Facetime, ZOOM, or respond via email. I will respond within 24 hours to any email I receive (allow 48 hours on weekends).

*Distance learning students will have access to libraries, learning centers, and/or laboratories on campus if they are local. They may also access all required materials electronically and are welcome to use their local libraries and personal computers.*

1. **Rubric and Grading Scale:**

Mastery of the material covered in this course is of greater importance than the actual grades.  I welcome individual discussion of progress in the course, including grades, at any time. The grading scale used for this course will be:

90 - 100 points = A

80 -89 points = B

70 -79 points = C

60 -69 points = D

59 points or below = F

1. **Class Policy Statements:**
2. Participation:  Students are expected to participate in all class discussions and participate in all exercises in this distance course.  Assignments are due on announced dates. Unexcused late assignments are unacceptable. If the professor agrees to accept a late assignment, there will be a 10% deduction for every day that it is late. However, accepting late work is at the discretion of the professor. It is the student’s responsibility to contact the instructor within 24 hours if assignment deadlines are not met. Students are responsible for initiating arrangements for missed work. Students must satisfy all course objectives to pass the course.

Although this course is a distance course, there will be virtual discussions on assigned readings. Responses to the readings and video clips will be submitted on Canvas according to the schedule. All responses to required readings, videos, posts, etc. for the week must be made before the due date.

You are expected to log on to Canvas and check your email **every weekday**. This ensures you are quick to respond should there be any questions or difficulties with your posts or assignments. The assignments for each week are grouped into modules. For discussions, you will post a **minimum of 2 responses to posts by your peers.**Hearing from the others in this class can be very thought-provoking and allow you to see perspectives you might not have considered before.

1. **Excused Absences**:  This is standard policy. Absences in a distance course are slightly different. If you feel you will miss assigned due dates because of an excused absence, please contact the instructor immediately. Students are granted excused absences for the following reasons:  Illness of the student or serious illness of a member of the student’s immediate family, the death of a member of the student’s immediate family, trips for student organizations sponsored by an academic unit, trips for University classes, trips for participation in intercollegiate athletic events, subpoena for a court appearance, and religious holidays.  Students who wish to have an excused absence for any other reason must contact the instructor in advance of the absence to request permission.  The instructor will weigh the merits of the request and render a decision. When feasible, the student must notify the instructor prior to the occurrence of any excused absences, but in no case shall such notification occur more than one week after the absence.  Appropriate documentation for all excused absences is required. Please see the [*Student Policy eHandbook*Links to an external site.](http://www.auburn.edu/student_info/student_policies/) for more information on excused absences ([http://www.auburn.edu/student\_info/student\_policies/)Links to an external site.](http://www.auburn.edu/student_info/student_policies/)).

1. **Make-Up Policy:**Arrangement to make up missed major examinations or coursework (e.g. hour exams, mid-term exams) due to properly authorized excused absences must be initiated by the student within one week from the end of the period of the excused absences.  Except in unusual circumstances, such as continued absence of the student or the advent of University holidays, a make-up exam will take place within two weeks from the time that the student initiates arrangements for it. Except in extraordinary circumstances, no make-up exams will be arranged during the last three days before the final exam period begins.  The format of the make-up exam will be *(as specified by instructor).*

1. **Disability 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. To set up the meeting, please contact the instructor 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).

1. Honesty Code:   All portions of the Auburn University student academic honesty code (Title XII) found in the [*Student Policy eHandbook*Links to an external site.](http://www.auburn.edu/student_info/student_policies/)will apply to this class.  All academic honesty violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee. **All work (except where group consultation is required in stated portions of chapter exercises) must be original work with proper citations and references**. Plagiarism is against the AU Academic Honesty Policy. **All submitted assignments are subject to a plagiarism check**.

1. Course contingency: If normal class and/or lab activities are disrupted due to illness, emergency, or crisis situation, the syllabus and other course plans and assignments may be modified to allow completion of the course. If this occurs, and addendum to your syllabus and/or course assignments will replace the original materials.

1. Professionalism:  As faculty, staff, and students interact in professional settings, they are expected to demonstrate professional behaviors as defined in the College’s conceptual framework. These professional commitments or dispositions are listed below:
2. Engage in responsible and ethical professional practices
3. Contribute to collaborative learning communities
4. Demonstrate a commitment to diversity
5. Model and nurture intellectual vitality

This course is centered on close, careful observation of students and classrooms, lively classroom online discussions, and critically examining standards and theories of teaching and learning. Your participation in online activities and discussions is important not only for your own learning but also the learning of others. Sharing your ideas and questions with the group, as well as responding to those of your classmates, are critical to our work together. As a teacher, you need to do more than understand your own thinking—you have to listen to others’ thinking, figure out what others are saying, and determine whether and how it makes sense. In our class, the “others” will be both your colleagues and the children we see in videos and read about, and myself. Please be open and participate so we can all learn together.

1. Use of *Canvas* system, internet, and email for communication and instruction is an integral part of the course. Your Auburn University email is the official form of communication by Auburn University. All assignments must be submitted in either rich text or Microsoft word format unless directions were given to use PowerPoint or some other type of program. ***The file should be saved as your first name and an abbreviation for the assignment***. For example: meganfromtheclassroom.docx. It is the student’s responsibility to check the assignment, once submitted to Canvas, to ensure it went through properly.  It is also the student’s responsibility to check email daily and Canvas regularly for updates and announcements. It is the student’s responsibility to ensure access to the appropriate technology or this distance course. If help is needed with technology, students are encouraged to schedule an appointment with the professor or Auburn University technology personnel.

1. All project assignments must follow style conventions of the 6th edition of the *APA Publication Manual* that is required for this course. In particular, headings, citations, references, tables, and figures should comply. Students should always have all formally written work peer reviewed for feedback before submission. The ***Miller Writing Center*** at Auburn University can assist in the writing and feedback process

Writing Center**:**The Miller Writing Center provides free support on any writing you are doing while at Auburn, whether for a course or not. Trained consultants are available to work with you as you plan, draft, and revise your writing. For students in distance courses and students temporarily away from Auburn’s campus, the Miller Writing Center offers synchronous online consultations. Please check the Miller Writing Center website ([www.auburn.edu/writingcenterLinks to an external site.](http://www.auburn.edu/writingcenter)) for instructions and information about scheduling online appointments. If you have questions about the Miller Writing Center, please email [writctr@auburn.edu](mailto:writctr@auburn.edu) or call 334-844-7475 M-F 7:45am-4:45pm.

1. Please remember that the assignments you see on Canvas count as both the class time that would occur in a campus class and the homework that would be required for this course. For graduate study, the rule of thumb is that an average student should plan for 3 hours of prep time for every hour of time in class. This is a 3-hour class, so you should be spending considerable time on this course. Please don’t hesitate to contact me with any questions or concerns. I am here to support you as much as possible. I am available to meet on campus, Facetime, ZOOM or respond via email. I will do my best to respond within 24 hours to any email I receive.