READ THIS SYLLABUS CAREFULLY. YOU ARE RESPONSIBLE FOR KNOWING THIS INFORMATION!

Class: BlackBoard hybrid online synchronous
Instructors:
Dr. Shelly Jones
Room 312 Maria Sanford Building
860-832-2857
jonessem@ccsu.edu
Virtual office hours:
Mondays and Wednesdays 11 am – noon
Tuesdays 12:30 – 1:30 pm and 3 – 4 pm
Wednesdays 4:30 – 5:30 pm

Dr. Maria T. Mitchell
Room 310 Marcus White Hall
860-212-6703 Cellular
mitchellm@ccsu.edu
Virtual Office Hours:
Tuesdays and Thursdays, 12:05 to 2:05pm
Fridays 12:30 to 1:30pm

Virtual Class Meeting Time: Tuesdays from 4:30 to 7:10 pm
please see tentative schedule

Course Description:

A survey of the research literature; evaluation of research techniques; consideration of relevant instructional curriculum theory; evaluation of modern teaching methods and techniques; preparation of Capstone Proposal

Course Objectives:

* To become familiar with major research paradigms in mathematics education
* To become familiar with major research questions in the teaching and learning of mathematics and the status of research-based knowledge related to each question.
* To develop the ability to critically analyze reported research studies, including issues of design, rationale, data collection, and interpretation.
To identify appropriate research questions for a given topic for your Capstone. To provide a literature review of the Capstone topic and design a research study to address the questions.

Submit completed Capstone proposal to Human Studies Council.

Course Requirements/Evaluation:

1. Active participation in class (Synchronous meetings as well as online discussions)
2. Written, critical reviews of two significant research studies (using APA format)
   - One study related to learning mathematics
   - One study related to teaching mathematics
3. Annotated Bibliography (10 entries, using APA format with 3 - 4 sentences for each annotation)
4. Written reflections (the status of research-based knowledge in math ed, ability to synthesize findings from the literature and class discussions)
5. Design of a complete research Capstone study including an extensive review of literature, research questions, theoretical framework and methodology.
6. Complete and submit the Human Studies Form

Required Texts:


NOTE: Online access via CCSU’s Burritt Library Website - Each CCSU student can download 100 pages. You will be asked to choose ONE chapter to download based on your proposal topic.

Reference Text:


Second Handbook of Research on mathematics Teaching and Learning: A Project of the National Council of Teachers of Mathematics

Extensive use of the *Journal for Research in Mathematics Education* will be made in this class. The journal can be found in the Elihu Burritt Library and on the internet at the NCTM website NCTM.org

NOTE: We will provide you with selected readings (available on BlackBoard) from the *Handbook of Research on Mathematics Teaching and Learning*.

Other Resources for Mathematics Education Research:

More Lessons Learned from Research, Volume 2 (2016). Editors Edward
Course Requirements

- The main goal of this course is for you to design a research study in some area of interest in mathematics education. This paper will become the basis of your Capstone Proposal. What you are writing in this class is assessed for MATH 598.

- The proposal you finally submit to the Graduate School and Human Studies Council starts the ball rolling for either MATH 590 or MATH 599. This activity will also take place in this course.

- In a class of this level excellent attendance is a must.

- NOTE ON WRITING: We want you to become a good writer using the format generally used by researchers. Therefore, when you write we want you to use the American Psychological Association (APA) style manual. When you write the two critical reviews of research you will cite other research which supports your criticism. When you do this, we want you to use the APA Manual.

- I/We will show you copies of proposals that have been submitted to the Graduate School in the past. Also pay attention to how the various researchers that you have read, write. They rarely use the first person. They often refer to themselves as “this researcher”, or they write in such a way as to avoid the whole thing. Try to pay attention to this.

- Professional language tends to prefer the word adolescent rather than teenager, mathematics rather than math, subjects as opposed to students. Try to be sensitive to your choice of professional vocabulary.

- You will each make a presentation of your proposed research using PowerPoint. When you do that we will video record you. The recording will be used by us as we reflect on your presentation. It should also be used by you, as you self-evaluate your presentation.

Scholarly journals that you may find useful in this course are:

- American Educational Research Journal
- Educational Psychologist
Educational Researcher
Educational Studies in Mathematics
Journal of Educational Psychology
Journal of Mathematical Behavior
Journal of Psychology
Mathematical Cognition
Mathematics Teacher: Learning & Teaching Pk12 (*Newest NCTM journal)
Mathematics Teaching in the Middle (NCTM)
Mathematical Thinking and Learning
Mathematics Teacher (NCTM)
Psychological Bulletin
Psychological Reports
Teaching Children Mathematics (NCTM)

Other useful bits of information.
University Policies:

1. If you need course adaptations or accommodations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible. My/Our telephone numbers and office hours are given above.

2. In the event of a weather emergency which requires curtailment or cancellation of classes, listen to WTIC (1080 AM) or call (860) 832-3333 for the “general snow message.”

Resources Available:

1. If you need help, take advantage of your instructors’ virtual office hours.
2. Share your writing with at least one other student in the class. Reading other’s papers will sharpen your own editing skills.
## MATH 598 Tentative Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Assignment</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept. 1</td>
<td>Expectations for course, APA, Graduate Thesis Handbook, Graduate resources, Schedule, Assignments</td>
<td>Write up (about one page) some questions about teaching and learning math that you might like to explore? Review Thesis Handbook Black Board- do before class meets?</td>
<td>Read Theoretical Perspectives Chapters 1 &amp; 2 from Handbook</td>
</tr>
<tr>
<td>Sept. 8</td>
<td>Virtual Library Theoretical Perspectives/ Research Paradigms</td>
<td>Read 2 Articles on Teaching and Learning</td>
<td>Will provide a template with assignment criteria</td>
</tr>
<tr>
<td>Sept. 15</td>
<td>No virtual class meeting time</td>
<td>Critique/overview/comparison on of the two articles that you will read determine if it is research on teaching or learning.</td>
<td>Blackboard discussion open Tues. - Sunday about the two articles</td>
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<tr>
<td>Sept. 22</td>
<td>No virtual class meeting time</td>
<td>2-3 page Critique due; post on BlackBoard by midnight (Show appropriate use of APA quotations, citations and reference list)</td>
<td>Read Methods Chapter from Handbook</td>
</tr>
<tr>
<td>Sept. 29</td>
<td>Virtual Library Conversation on Teaching and Learning: Theoretical Frameworks, Research Questions, Methods, Findings</td>
<td>Read a chapter from the Handbook based on your proposal topic (so far)</td>
<td>Think about your proposal.</td>
</tr>
<tr>
<td>Oct. 6</td>
<td>Visual Presentations: Handbook Article summary Literature Review</td>
<td>Conversations on Teaching and Learning Research Articles. Annotated Bibliography (Use APA style, 3-4 sentences summarizing each reading)</td>
<td>Contact your thesis advisor</td>
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<tr>
<td>Oct. 13</td>
<td>Draft Bibliography due for feedback post on BB</td>
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<tr>
<td>Oct. 20</td>
<td>Write draft proposal to include everything up to Methodology</td>
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<td>Read research articles with focus on Methodology</td>
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<td>Date</td>
<td>No virtual class meeting time</td>
<td>Time</td>
<td>Activity Description</td>
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<tr>
<td>Oct. 27</td>
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<td>4:30pm to 7:10 pm</td>
<td>Partner peer review of proposals</td>
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<td>Discuss Qualitative/Quantitative</td>
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<td>Write one-page reflection on your proposal methodology: Qualitative/Quantitative?</td>
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**November 3**
No virtual class meeting time
**Election Day**

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<thead>
<tr>
<th>Date</th>
<th>No virtual class meeting time</th>
<th>Time</th>
<th>Activity Description</th>
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</thead>
<tbody>
<tr>
<td>Nov. 10</td>
<td></td>
<td>4:30pm to 7:10 pm</td>
<td>Review Proposal Rubric</td>
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<td>Full draft proposal including methodology</td>
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<th>Time</th>
<th>Activity Description</th>
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</thead>
<tbody>
<tr>
<td>Nov. 17</td>
<td></td>
<td>4:30pm to 7:10 pm</td>
<td>Work on proposal at home</td>
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**November 24**
No virtual class meeting time
**Happy Thanksgiving**

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<thead>
<tr>
<th>Date</th>
<th>No virtual class meeting time</th>
<th>Time</th>
<th>Activity Description</th>
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<tbody>
<tr>
<td>De. 1</td>
<td></td>
<td>4:30pm to 7:10 pm</td>
<td>Presentations of Proposals</td>
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<td></td>
<td></td>
<td></td>
<td>Powerpoint Presentations</td>
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<tr>
<td>Dec. 8</td>
<td></td>
<td>4:30pm to 7:10 pm</td>
<td>HSC</td>
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<td>Overview of Human Studies Requirement</td>
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<tr>
<td>Dec. 15</td>
<td>Tentative meeting if need to meet</td>
<td>4:30pm to ?</td>
<td>Final proposal due and Human Studies submission</td>
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**Important background research (this list is ongoing):**

1. Research on Teaching.
   a. Good & Grouws, 1979
   b. Lampert, 1990
   c. Selling, 2016
   d. Boston & Smith, 2009
2. Research on Learning - Choose a specific math content
   c. Algebra: Clement, 1982; Knuth et al., 2006
3. Theoretical Framework
   a. Cai et al. (2019)
   b. Corbin & Strauss (1990)
4. Methodology
   a. Miles & Huberman (2016)
b. Creswell (2009)