Central Connecticut State University
Math 412 02 – Elementary Mathematical Methods
Fall 2018

Professor: Dr. Shelly M. Jones
Course Sections: 02 (10653)
Location: Maria Sanford 214
Class Time: MW 1:40 – 2:55 pm
Office: Maria Sanford 312
Telephone: (860) 832-2857
E-mail: jonessem@ccsu.edu
Office Hours: Mondays 6 – 7 pm
Tuesdays 10 am – noon
Wednesdays 10 am – noon
Other times by appointment

Course Overview: This course examines the methods and procedures in teaching mathematics concepts at the elementary level. It is designed to prepare pre-service elementary teachers to become independent professionals who can effectively arrange learning environments, plan educational activities, assess learning outcomes, and integrate technology, culture and children’s literature within lessons. The course content will be presented using practices that are aligned with the National Council of Teachers of Mathematics (www.nctm.org) Standards and the Connecticut Core Standards (http://ctcorestandards.org/). Teacher Candidates will have the opportunity to apply the content and pedagogy from this course and other methods courses by taking part in a field experience practicum during the semester (EDTE 420, EDEL 415, RDG 412, SCI 412, FA 412). This course is taken the semester before student teaching.

Prerequisite: Math 213: Structure in Mathematics II: Probability and Geometry (C- or higher) and admission to the Professional Program


Recommended Resource:
**Journal Readings:** *Teaching Children Mathematics, Mathematics Teaching in the Middle School* and other educational journals.

**Email:** All students are required to have a working CCSU email account. All course correspondence will be sent to CCSU email accounts only. Technology will be an important component of classroom teaching and learning. Students will use computers including Smartboard-type software and the Internet to supplement course content and to research elementary and middle school education topics.

**Course Objectives:**

A. To examine the content and presentation of mathematics currently being taught in elementary schools.

B. To introduce students to curricular reforms and current literature in the area of teaching mathematics in elementary schools.

C. To encourage students to examine and reflect on their professional background in mathematics with a goal of self-improvement.

D. To anticipate current educational trends with a view to the future needs of all educated people in the area of mathematics.

E. To introduce students to the Common Core State Standards for Mathematics and Mathematical Practice

F. To help students become more aware of how to teach culturally relevant mathematics.

**University Policy:**

The last day to withdraw from the course with a W is November 19th. Cessation of attendance, notice to the instructor, or telephone calls to the Enrollment Center are not considered official notice of a student’s intention to withdraw from the course. The student must complete and submit the appropriate Withdrawal form.

**Professor Policy:**

**Attendance:** You are expected to attend all class meetings on time and participate in class activities and discussions. All reading assignments should be completed prior to the appropriate class session. Please bring your Hatfield textbook to each class. In the unlikely event that you are unable to attend a class session, please send me an e-mail explaining your absence. It is the student’s responsibility to obtain homework and journal assignments in the event of an absence. Late assignments will only be accepted the next class meeting with an excused absence or with points deducted.
**Evaluation:**
Your grade for the course will be determined in the following manner as outlined below.

1. **EdTPA Task 4:**
   - a. Context for Learning (Parts A&B)
   - b. Re-engagement Lesson
   - c. Assessment Commentary
   - d. Final Write up (15%)  
     **25% of grade**

2. **Class attendance & participation in discussions, group activities and presentations:** Class participation is an essential component of this course; therefore, consistent attendance is essential.  
   **16% of grade**

3. **Written Reflections:**  
   - a. Math anxiety/phobia
   - b. Culturally relevant teaching
   - c. Getting to know a student  
   **9% of grade**

4. **Lesson Plans:** You will write TWO math lesson plans and a re-engagement lesson plan.  
   - a. Culturally Relevant or Social Justice Math Lesson
   - b. Lesson connected to children’s literature and/or hands-on manipulatives and/or technology
   - c. Re-engagement lesson to teach with students at your placement (this plan is counted as part of your edTPA grade – see #1 above)
   - d. Choose one of these lessons to microteach to your classmates  
     (Each lesson plan is 10%, Reflection 5% and presentation is 10%)  
     **35% of grade**

5. **Article readings and class discussions:** You will participate in class discussions about articles you read. Provide a brief overview, key points of the article. It is important to demonstrate how the content addressed can be implemented in the classroom. (2 sessions: Culturally Relevant and Effective Instructional Strategies)  
   **6% of grade**

6. **Field Experience Journal:** Journal assignments are due periodically throughout the semester. The journal topics & prompts are listed on Blackboard (Bb). Please date each entry and write your name and the given journal # and topic at the top of the appropriate page before submitting. Limit one journal entry per page. Your response should be one typed page with correct spelling, grammar, and punctuation. The journal prompt will give you the opportunity to reflect on and give your written opinion on an important math or educational issue. Your opinion should be supported by episodes in your field site, readings from the text, and/or class discussions. Journals will be collected and graded. **Journal Reflections must be submitted on Bb on or before the due date.**  
   **9% of grade**
Note: “Students enrolled in this course who are seeking teacher certification should be aware that all professional education courses are guided by the Conceptual Framework of the School of Education and Professional Studies. Professional education courses prepare students to be active learners, reflective and collaborative practitioners, and facilitators of learning for all students. The complete Framework may be accessed at http://www.education.ccsu.edu/SEPS_Conceptual_Framework.pdf.”

### Math 412 Elementary Mathematical Methods

#### Tentative Schedule of Topics

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic (TO DISCUSS IN CLASS)</th>
<th>HOMEWORK (readings, etc.) and ASSIGNMENTS: Do these readings (etc.) AFTER class that day. Therefore, it is done in preparation for the next class. When Due Dates are listed, the assignment IS DUE THAT DAY usually on Bb by midnight.</th>
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| **Week 1** | Icebreaker  
Overview of Course & Expectations, Common Core Math Content and Math Practice Standards,  
Cognitively Demanding Math Task Sort, Diversity Survey | Tonight:  
**Read:** Jo Boaler’s Math Anxiety article before coming to class next week!  
**Read:** Stein & Smith (1998) article on level of cognitive demand in math tasks and Van de Walle Chapter 3 pgs. 37-43. |
| **Week 2** | Level of cognitive demand discussion  
Math Anxiety Discussion  
Introduce edTPA core ideas – Conceptual Understanding, Procedural Fluency, & Problem Solving/Reasoning  
edTPA activity (Pointing out conceptual understanding, procedural fluency & reasoning) | **Read:** Choose one article and be ready to share main points in next class:  
Johnson (2011) Social Justice Math  
Felton (2010) – Is Math Neutral?  
Turner & Strawhun (2007) – Using Math to investigate overcrowding  
Leonard & Guha (2002) – Cultural Relevance  
Ukpokodu (2011) Culturally Responsive Teaching  
| **Week 3** | Class Discussion: Culturally relevant pedagogy.  
Share main points of each reading (3-5 minutes each) on doc cam or powerpoint.  
Discuss patterns/common characteristics  
Dr. Jones CRP Powerpoint | **DUE:** Math anxiety reflection paper DUE today by midnight. Upload to Bb.  
**Read:** Van de Walle Chapters 1 & 2. |
| **Week 4** | Brain Research Activity  
Discuss Van de Walle Chapters 1 & 2  
Chapter 2: Let’s do some math!  
Discuss Relational Understanding  
Discuss Theories of Learning: How do students learn math? | **DUE:** Reflection paper on culturally relevant teaching/lessons Due tonight by midnight. Upload to Bb.  
**Read:** Van de Walle Chapter 3 (pgs. 49-53) and Chapter 4 (pgs. 1 – 69 and 72 – 75) |
<p>| <strong>Week 5</strong> | Orchestrating Classroom Discourse: 1.1 Intro | <strong>DUE:</strong> edTPA Part A: Elementary |</p>
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<tr>
<th>Week 6</th>
<th><strong>Discuss Teaching Through Problem Solving:</strong> Van de Walle Chapter 3.</th>
<th><strong>DUE:</strong> Van de Walle Chapter 3 (pgs. 33-37)</th>
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<td><strong>Orchestrating Classroom Discourse:</strong> 5.1 Solving a Multistep Word Problem (video &amp; discussion).</td>
<td><strong>Read:</strong> Choose one article to read with a partner and share with classmates next class: Iliev &amp; D’Angelo (2014) Multicultural Children’s Literature</td>
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<td><strong>Purposeful Questions (Principles to Actions)</strong></td>
<td>Umbeck (2011) – Navigating Classroom Change</td>
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<td><strong>Plan microteaching segments</strong></td>
<td>Drake et al. (2015) Opening Curriculum Spaces</td>
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<td><strong>Plan microteaching lesson with feedback from Professor and classmates</strong></td>
<td>Gear (2012) – Culture in Math, sharing with families</td>
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<td><strong>Creating Assessments (&amp; Rubrics) for Learning – Van de Walle Chapter 5</strong></td>
<td>Bring a children’s literature book to class next week – be ready to discuss how can you connect it to math?</td>
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<td><strong>Discuss Scoring student work</strong></td>
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<td><strong>Introduce edTPA Assessment Commentary</strong></td>
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<td>Week 7</td>
<td><strong>Culturally Relevant/Responsive Teaching and Social Justice Math:</strong> Discuss articles (each group summarize 3-5 minutes) other groups ask questions</td>
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<td><strong>Orchestrating Discourse:</strong> 4.1 Adding by Place Value</td>
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<td><strong>Discuss using children’s literature in mathematics lessons (Bring a children’s literature book)</strong></td>
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<td><strong>Discuss EdTPA Task 4 Assignment</strong></td>
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<td>Oct. 22</td>
<td><strong>Midterm (No Exam)</strong></td>
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<td>Week 9</td>
<td><strong>Discuss Van de Walle Chapter 8, Developing Early Number Concepts (Role plays)</strong></td>
<td><strong>DUE:</strong> edTPA Part B: Elementary Mathematics Learning Segment Overview.</td>
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<td><strong>Dr. Jones Number Talks Powerpoint</strong></td>
<td><strong>DUE:</strong> Lesson Plan One (Your choice: CR, Lit/Manip/Tech or Re-engagement).</td>
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<td><strong>Discuss Van de Walle Chapter 9</strong></td>
<td>Both by midnight on Bb.</td>
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<td><strong>Explore Alternate algorithms for +, -, x, ÷</strong></td>
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<td>Week 10</td>
<td><strong>Lesson Demonstrations</strong></td>
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<td>Week 11</td>
<td><strong>Lesson Demonstrations</strong></td>
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<td>Week 12</td>
<td><strong>edTPA- student work sample analysis Planning Re-engagement</strong></td>
<td><strong>DUE:</strong> Journal #2, #3 or #4 (your choice)</td>
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Getting to know a student
Discuss Community Walk Activity

Nov. 19
Last Day to Withdraw without Permission

Week 13
Orchestrating Discourse: 5.2 Placing Fractions on a Number Line
Getting to know a student sharing edTPA work sample sharing

Week 14
Part G: Math Assessment Commentary
Math Activity Stations
Children’s Literature

Week 15
edTPA Task 4 Findings Presentations

Week 16
Due: Final Project – edTPA Task 4 (Practice)
(in lieu of final exam)

Van de Walle. Chapter Six: Teaching Mathematics Equitably to All Children

8th Edition:
Everyone read intro “Math for all students” and “Final Thoughts”.
Group 1: Pgs. 96 – 100 (students who struggle including students with mild disabilities)
Group 2: Pgs. 100 – 102 (moderate to severe disabilities)
Everyone: Pgs. 102 – 104 (culturally and ethnically diverse)
Group 3: Pgs. 104 – 107 (English Language Learners)
Group 4: Pgs. 107 – 111 (gender and mathematically gifted)

Note: if you have another edition just follow the topics on equity stated above
Math 412 – Journal Topics (one-page reflections)

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<thead>
<tr>
<th>Journal #</th>
<th>Topic and writing prompt</th>
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<tr>
<td><strong>EVERYONE DOES JOURNAL #1</strong></td>
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<tr>
<td>1</td>
<td><strong>State Math Assessment (Smarter Balance):</strong> Write a letter to parents about the new Smarter Balance Assessment. Provide a summary of what the test is and its significance. What would you do as a teacher to prepare the students for the math portion of the test? What can parents do at home to help students with their math?</td>
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<td><strong>CHOOSE TWO JOURNALS FROM #2-4</strong></td>
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<td>2</td>
<td><strong>Math Lesson Objectives:</strong> In a class period this week, take the perspective of the student. Observe and comment on the following: What is the math lesson objective? Do students understand that this is the objective? Explain why or why not. Was the objective met? How do you know? How does the teacher know that the lesson objective was met and that the students mastered the content?</td>
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<td>3</td>
<td><strong>Classroom Discourse/Classroom Environment:</strong> In a class period this week, take the perspective of the student. Observe and comment on the following: Student-Teacher Relationship: What is the type of discourse (communication) taking place during the math lesson (i.e., is the focus on making sense of the math or getting the correct answer)? Who volunteers during math? Does the teacher call on the students who volunteer? Does the teacher call on students that do not volunteer? Are the students actively engaged in the math activity and the discussion?</td>
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<td>4</td>
<td><strong>Skills vs Concepts:</strong> In a class period this week, take the perspective of the student. Observe and comment on the following: Is the teacher focused on basic skills or mathematical concepts (what the math really means)? As a student, would you be motivated to do well in this class? Do you think that the students understand the material in the way it is presented? What suggestions do you have for the teacher?</td>
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<td><strong>EVERYONE DOES JOURNAL 5</strong></td>
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<td>5</td>
<td><strong>Community Walk</strong></td>
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<td>1. <strong>Visit one or more locations in the community.</strong> Visit locations in the community surrounding your field experience school. It is important that you are brave and willing to walk off of the school grounds. Select locations that are familiar to students (i.e., places that draw families in the community, social hubs).</td>
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<td>2. <strong>During your visit(s), Look For and Document Evidence of Mathematics.</strong> If possible, talk to individuals who work/play/shop in the setting about how they use mathematics. <strong>Take/draw pictures and field notes.</strong> Identify how each picture or experience you document provides evidence of mathematics. During your visit, refrain from making judgments about the neighborhood. The goal of the community visit is to learn from the community and identify resources for future lesson planning. It is also a time for you to confront stereotypes or assumptions you may have had. If you have the opportunity, show students from your field site your photographs and have them tell you what they know about these places, and if relevant what they (or their family) do at these places (especially if it involves mathematics). You will be amazed at how much more they will share with your photos in hand!</td>
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| | 3. **Formulate a Question and Data Sources about the context that could be mathematized.** Start by reviewing the pictures and notes that you took, and brainstorming a list of possible community-centered questions and data sources to answer the question(s). Try to generate and settle on a question that “matters” – in other words, this should be a question that you, students, or someone else in the school or community would actually want answered. You might consider a question that involves a comparison of some kind, or a question that relates to issues of equity. Also, make sure that your question can be answered using mathematics. For an example see Tate (1995) or Leonard (2008). What data could be gathered to answer your question? This might be data that is immediately evident in the context
(the price of an item; the cost of gasoline, the number of tickets required to earn certain prizes), or data that you need to generate (you can measure distances, take temperatures, keep track of time, look at menus, record examples of shapes, keep track of people who visit an establishment or cars that drive by, or the items that people order, etc.). Data collection may also involve talking to people at the site (interviewing employees, etc.) and/or gathering data from other sources (e.g., the internet, phone calls).

THE OFFICE OF DIVERSITY AND EQUITY (ODE)
STATEMENT ON DISCRIMINATION AND HARASSMENT
Central Connecticut State University strives to maintain our campus as a place of work and study for faculty, staff, and students that is free of all forms of prohibited discrimination and harassment based upon age; ancestry, color; gender identity and expression; intellectual disability; learning disability; mental disorder; physical disability; marital status, national origin; race; religious creed; sex, (including pregnancy, transgender status, sexual harassment and sexual assault); sexual orientation; or any other status protected by federal or state laws. Any student who has concerns should contact the Office of Diversity and Equity (ODE), Student Affairs, or his/her faculty member.

SEXUAL MISCONDUCT, INTIMATE PARTNER VIOLENCE AND STALKING
Central Connecticut State University (CCSU) will not tolerate sexual misconduct against students, staff, faculty, or visitors in any form, including but not limited to: sexual assault, sexual exploitation, sexual harassment or stalking, as defined in CCSU policies. For additional information, please consult the CCSU policy at http://www.ccsu.edu/diversity/policies/BORSexualMisconductFeb2015.pdf. All faculty members and staff have a duty to report incidents of sexual harassment including sexual misconduct, intimate partner violence and stalking to Rosa Rodríguez, Title IX Officer, Office of Diversity and Equity, Davidson Hall, 102.

The Writing Center offers free one-on-one sessions with a talented and experienced staff of undergraduate, graduate, and faculty tutors. The Center works with students from any discipline and at any stage in their writing process, including interpreting assignment prompts, brainstorming material, and integrating research. The Writing Center is open Monday through Friday during the fall and spring semesters while classes are in session. For current hours, check the Center’s website at http://www.ccsu.edu/writingcenter.

THE LEARNING CENTER
It can be confusing and stressful when you are struggling in school and do not know where to turn. Often, students run into issues with their academics because they are unsure of what to do or who to ask for help. Ask us... We are here for you! The Learning Center, 860.832.1900, Carroll Hall 016

Not getting the grades you want? Or need to get more done in less time? Academic Coaching is a personalized program to help you maximize the effectiveness of time spent studying.
Academic Coaching is located in The Learning Center, Carroll Hall 016. Call to schedule an appointment today 860.832.1900.
The Learning Center offers drop-in tutoring for math, statistics, general and organic chemistry and intro physics. Please bring your books, notes and assignments. Our peer tutors will work with you to help you master the material. Day and evening hours are available – please refer to our website http://web.ccsu.edu/tlc

EARLY ALERT
The Early Alert program is a way for professors to let students know that they may be in jeopardy of doing poorly in a course before the end of the semester. The Early Alert program is designed to connect you with the help you need while there is still time in the semester to improve your performance in the class. Early Alert referrals do not go on your record. If you are referred to Early Alert, please contact the Early Alert Coordinator to get the assistance you may need! The Learning Center, 860.832.1900, Carroll Hall 016.

ELIHU BURRITT LIBRARY RESOURCES
Get help with all of your research needs. Librarians offer one-on-one assistance at the Reference Desk or by appointment. We also offer instruction in all aspects of the research process, including where and how to find books in the library or online, how to access articles and scholarly resources from databases, and how to format citations. Librarians can also support your research needs by making library resources from around the world available through interlibrary loan. Textbooks and course readings are often available through our course reserves system. Visit, call, email, or chat with librarians during regular library hours to use or learn more about library services and resources - 860-832-2060 - or visit the library online at http://library.ccsu.edu.

STUDENT DISABILITY SERVICES
If you are a student with a documented disability, and would like to request academic accommodations, you are encouraged to contact Student Disability Services (SDS) at 860-832-1952, or email disabilityservices@ccsu.edu. Please visit the SDS website at http://www.ccsu.edu/sds/ to download an Intake form and documentation requirements. Temporary impairments may also qualify for accommodations. Central Connecticut State University provides reasonable accommodations in accordance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act for students with documented disabilities on an individualized basis.

ACADEMIC INTEGRITY
At Central Connecticut State University, we value personal integrity as fundamental to our interactions with each other. We believe that one of the purposes of a University education is for students learn to think critically, to develop evaluative skills, and to express their own opinions and voices. We place special weight on academic honesty in all of our intellectual pursuits because it is a value that is fundamental to academic life and scholarly practice. All members of the University community are obligated to uphold high standards of academic honesty in their scholarship and learning. Therefore, we expect you to take personal responsibility for your intellectual work and to respect and acknowledge the ideas of others. Academic honesty means doing you own work and giving proper credit to the work and ideas of others. It is your responsibility to become familiar with what constitutes academic dishonesty and plagiarism and to avoid all forms of cheating and plagiarism. For more information, see: http://www.ccsu.edu/academicintegrity/

REGISTRAR’S OFFICE
REGISTRATION/ADD/DROP/EVENTUAL PERIODS
You are permitted to add/drop courses, subject to seat availability, through the end of the first week of the semester. Course drops (without a “W” on your transcript) are permitted through the end of the third week of the semester. Withdrawals beginning at the fourth week of the semester will result in a “W” on your transcript. Withdrawals after the twelfth week of the semester will only be permitted if there are extenuating circumstances, supported by documentation, and approval by the Instructor and Department Chair. Add, Drop, and Withdrawal deadlines are prorated for courses less than full semester length. Refer to the Office of the Registrar Calendar at www.ccsu.edu/registrar for specific dates each term.

ADVISING AND REGISTRATION FOR FUTURE SEMESTERS
Academic Advising begins in late-March for the fall semester and mid-October for the spring semester. Refer to www.ccsu.edu/registrar for advising and registration details, including access to the course schedule and identifying registration start date and time.

FINAL EXAM SCHEDULE
The standard final exam schedule is posted at www.ccsu.edu/registrar by the start of each semester. Examinations will be held in your regularly scheduled classroom unless you are told otherwise by your instructor.

INCLEMENT WEATHER POLICY
At the discretion of the President, classes may be cancelled or delayed because of inclement weather or special circumstances. The most accurate cancellation and delay information for Central Connecticut State University will be made available on the Storm Phone: (860) 832-3333 and on the Web at www.ccsu.edu, usually by 6:00 am.