I. Title: MATH 344 01 (CRN 42569): Mathematics in Diverse Cultures, 3 credits

Meeting times: MW 10:50 am – 12:05 pm
Classroom: MS 214

II. Instructor: Dr. Shelly M. Jones
Phone: Office: (860) 832-2857
Email: jonessem@ccsu.edu
Office: Maria Sanford 312
Office Hours: Mondays 12:30 – 1:30 pm
Tuesdays 10 am – noon and 3 – 4 pm
Wednesdays 12:30 – 1:30 pm
Other times by appointment

III. Course Details:

Course Description:
This course explores principles of equity, diversity and social justice in teaching and learning mathematics. The course will provide students with a) an opportunity to expand their knowledge of issues of equity, diversity and social justice in the context of mathematics education; b) an opportunity to develop a culturally relevant pedagogy for teaching mathematics; and c) an opportunity for students to explore the mathematical contributions of different cultures.
Credits: 3
Prerequisite: Permission of instructor.
General Education

Course Goals:
Future teachers will:
• Articulate a culturally relevant pedagogy for teaching mathematics.
• Be able to apply knowledge of issues of equity, diversity, and social justice to the development of mathematical lessons.
• Identify ways to use mathematical contributions of diverse cultures to align their teaching with the cultures of their students.

Texts


**University Policies:**

1. You must take the final examination (if an exam is scheduled) at the time specified in the course selection book.
2. 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 telephone number and office hours are given above.
3. In the event of a weather emergency which requires curtailment or cancellation of classes, listen to WTIC (1080 AM) or call (860) 832-3333.
4. The last day to drop a summer course is ____________________. 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 drop the course.

**Resources Available:**

1. If you need help, take advantage of your instructor’s office hours. Do not wait until just before the first test to do so.
2. The Learning Center is located in Carroll Hall. Free math tutoring is available. Check for summer hours.
3. A list of private tutors for hire is available in the math department office in Marcus White or call 860-832-2835.

**Evaluation**

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<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>93%</td>
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<tr>
<td>A-</td>
<td>90%</td>
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<tr>
<td>B+</td>
<td>87%</td>
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<td>B</td>
<td>83%</td>
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<td>C+</td>
<td>77%</td>
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<tr>
<td>C</td>
<td>73%</td>
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<tr>
<td>D+</td>
<td>67%</td>
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<tr>
<td>D</td>
<td>63%</td>
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The average for the course will be based on the following weights:

- **Class Participation/Attendance & Class Assignments** 15%
- **Online Discussions (2 @ 5pts each)** 10%
- **Reflection Prompts (readings, textbooks, class discussions)** 15%
- **Take Home Exam** 10%
- **Ethnomathematics Project (abacus, quipu, etc.)** 05%
- **Lesson Facilitation (Math is a Verb)** 05%
- **Global Math Story Lesson Plan and Presentation (Ethnomathematics)** 15%
- **Final Exam (Math Content & Course Reflection with Annotated Bibliography)** 25%

**Class Participation**
You are expected to attend every scheduled class meeting and participate fully in class discussion and class activities. In addition, there are a number of assignments related to in-class activities. Some are papers designed to encourage reflections on the mathematics you have learned and the way in which you are learning it. See Topic Reflections below. Some of the activities are hands-on activities that require you to complete a task related to our study. You may be asked to respond to questions about the activity as part of the completion of a task. See Project Reflections below.

**Lesson Facilitation:** You will facilitate a lesson from *Math is a Verb* to the whole class. Your lesson must focus on both the culture and the mathematics, and meet some specific Common Core mathematics standard(s) which you identify. Afterwards (in your final reflection) you will write a brief reflection.

**Reflection #1: Positioning Yourself**

Consider and answer the questions on the "Positioning Yourself" assignment sheet. Questions such as: What do you know about your name? Who are you? How will this effect your future classroom instruction? etc. Write a one-page reflection and upload it to Blackboard.

**Reflection #2: Mathematics “Getting to Know You” Interview**

Prospective teachers conduct an interview with a student from an urban school that is different from the school you attended, in an effort to become more familiar with the student’s activities and interests, the student’s home and community knowledge base and home and community resources. Knowledge gained from this interview can be used to inform the Community Walk activity. A handout will be provided with more detailed instructions.

**Reflection 3: Community Walk Project** *(can make visits in pairs, but write-ups should be individual)* Prospective teachers conduct one or more visits to the community surrounding their field-placement school. There are various options for these visits, depending on the particular circumstances of each site. Pay particular attention to the mathematics that occurs within this community and outside of the school. Multiple visits may be needed (including virtual visits) to collect the needed information. A handout will be provided with more detailed instructions.

**Reflections** may consist of:

- Key vocabulary words from the lessons and exercises that week and an explanation of what they mean in your own words
- A summary of the big ideas from the lesson and your understanding of them in your own words
- Questions or observations about concepts that you do not fully understand or find interesting
- The reflections will be evaluated on the basis of mathematical accuracy, cultural relevance and curiosity, mathematical insight, and clarity of expression.
**Mathematics Lesson Development** *(may be completed in pairs or independently)*

Prospective teachers draw on what they learned from the community visits to inform their instruction and create a locally culturally relevant lesson. Lessons will be presented in class. A handout will be provided with more detailed instructions.

**Global Math Stories Lesson Plan Project:**
Select an ethnomathematics topic. Investigate what is available using the web and library references to integrate math and culture. Write a lesson plan for the global math stories website, [www.globalmathstories.org](http://www.globalmathstories.org), and present what you have learned in a twenty minute lesson to the class. You must include **hands-on activities** and a **handout** for students in the class.

**Course Reflection (and Annotated Bibliography)** – Will include you reflecting on your projects, reflections, online discussions and your lesson plan. This can be submitted electronically or handed in on the final exam day.

**The Annotated Bibliography** must include a **variety** of five resources relevant to connecting math and culture in the classroom (They may NOT be all websites)

**Take Home Exam**
This exam will cover content from course, but with special emphasis on math content including math involved in cultural games, the use of children’s literature to connect math and culture, alternate algorithms for math computation and knowledge of culturally relevant pedagogy and equity approaches to teaching math.
# Math 344 Tentative Schedule

<table>
<thead>
<tr>
<th>Date (if not stated we meet in class)</th>
<th>Focus</th>
<th>Readings and Assignments completed PRIOR to (in prep for) this class</th>
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| **W Jan. 23**                        | Introductions, Syllabus, Discuss Assignments: People of Ethnomathematics/World Regions/Global Math Story Lesson Plan/Etc. Required and Recommended Textbooks, Write a paragraph, “What is culturally relevant teaching”? Discuss: Where is culture in learning mathematics? | Read:  
1) *Rethinking Mathematics*—“Teaching Math Across the Curriculum” Ch. 1 pp. 1-15  
2) Felton (2010) article  
Answer “Positioning Yourself” questions |
| **M Jan. 28**                        | Report out on Positioning Yourself Discuss Felton “Window/Mirror” Write a paragraph: What is equity in education? | Read:  
1) *Math is a Verb* – Introduction: Crossroads of Math and Culture  
2) “Addressing the Equity Principle in the Mathematics Classroom” (Bartell et al., 2008) |
| **W Jan. 30**                        | Discuss:  
1) The “Crossroads” of Math and Culture  
2) The Equity Principle  
Dr. Jones powerpoint presentation:  
• Equity in education (with survey)  
Assign “Getting to Know You” Interview | Read: “The Equity Principle through the Voices of African American Males” (Berry, 2004)  
**Explore the Global Math Stories website** ([www.globalmathstories.org](http://www.globalmathstories.org)). Choose a story to discuss in an online discussion. Start your discussion any time between Jan. 30 – Feb. 4 |
| **M Feb. 4 Online**                  | Global Math Stories Online Discussions:  
• Post a short description of your selected GMS by midnight Feb. 4  
• Respond to 2 classmates by class time on Feb. 6 |  
| **W Feb. 6 In Class**                | Discuss *Global Math Story* lesson plan project  
World Map Task  
Choose *Global Math Story* Partner Groups  
Choose *Math is a Verb* Partner Groups | Read:  
1) *Math is a Verb* – African Diaspora, Ch 1  
2) *Math is a Verb* – Guatemala, Ch 2  
3) *Math is a Verb* – Brazil, Ch 3 |
| **M Feb. 11 Online**                 | Online discussions about *Math is a Verb* Chapters 1 – 3 | Read:  
4) *Math is a Verb* – Southwest US, Ch 4  
5) *Math is a Verb* – Ghana, Ch 5  
6) *Math is a Verb* – Germany, Ch 6 |
| **W Feb. 13 Online**                 | Online discussions about *Math is a Verb* Chapters 4 – 6 | Read:  
7) *Math is a Verb* – Urban, Ch 7  
8) *Math is a Verb* – S. Pacific, Ch 8  
9) *Math is a Verb* – India, Ch 9 |
| **M Feb. 18**                        | Presidents Holiday |  

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<tr>
<th>Date</th>
<th>Activity</th>
<th>Reading Assignment</th>
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<tr>
<td>W Feb. 20</td>
<td><strong>In class</strong> Discuss <em>Math is a Verb</em> Chapters 7 – 9</td>
<td>Read: “Developing Number Sense: What Can Other Cultures Tell Us?” (Zaslavsky, 2001)</td>
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<td>M Feb. 25</td>
<td>Math is a Verb: Partner Group Lesson Presentations – Groups 1, 2, &amp; 3</td>
<td>Read: “Creating Mathematical Futures through an Equitable Teaching Approach: The Case of Railside School” (Boaler &amp; Staples, 2008)</td>
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<td>W Feb. 27</td>
<td>Math is a Verb: Partner Group Lesson Presentations – Groups 4, 5, &amp; 6</td>
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<tr>
<td>M March 4</td>
<td>Math is a Verb: Partner Group Lesson Presentations – Groups 7, 8, &amp; 9</td>
<td>Read: Culturally Relevant Pedagogy (Ladson-Billings, 1995)</td>
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<td>W March 6</td>
<td>Dr. Jones powerpoint presentation:</td>
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<td></td>
<td>• Culturally Relevant Math</td>
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<td>Assign <em>Community Walk</em> Project</td>
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<td>Spring Break: March 11 – 16</td>
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| M March 18 | **In Community** Conduct a “Community Walk” in your selected school district (preferably rural or urban, ideally different from your school district growing up) | Read: 1. *Rethinking Mathematics* – “Teaching Math Across the Curriculum” Ch. 1 pp. 1-15  
2. “Funds of Knowledge for Teaching: Using a Qualitative Approach to Connect Homes and Classrooms” (Moll, 1992) |
| W March 20 | Discuss in small groups your “Getting to Know You” student and how you can use this information to write a math lesson | “Getting to Know You” Interview Due, upload to Bb                                   |
|            | World Wealth Math Task                                                    | Read: “Cultural capital in children's number representations” (McCulloch et al., 2009) |
| M March 25 | Alternate Algorithms in Math                                              | Choose one to Read: 1) “Cultural and linguistic resources to promote problem solving and mathematical discourse among Hispanic kindergarten students” (Turner et al., 2008)  
2) “Mathematics: the universal language? (ELLs) (Hoffert, 2009) |
| W March 27 | Egyptian Fractions                                                        | Read: “Does race matter?” (Martin, 2009)                                           |
|            | Golden Ratio                                                              |                                                                                     |
| M April 1  | Dr. Jones at NCTM Conference                                               | Take Home Test                                                                       |
| W April 3  | No Class                                                                   | Bring a children’s literature book to next class. Be ready to discuss how you can use the book in a math lesson. |
| M April 8  | Discuss the Math in Multicultural Childrens Literature                    | Read: 1. “What Values Do You Teach When You Teach Mathematics?” (Bishop, 2001)  
2. “A Cultural Introduction to Math” (Gear, 2012) |
<p>| W April 10 | Class discussion: Ethnomathematics                                        | Read: “Developing Number Sense: What Can                                          |</p>
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<th>Date</th>
<th>Activity</th>
<th>Read</th>
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<tr>
<td>M April 15</td>
<td>Numbers in different base systems Abacus project</td>
<td>Read: Dr. Gould’s Tellem Weavers article</td>
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| W April 17 | Guest Lecturer: Louise Gould One of the following:  
• The math of basket making  
• The math of weaving  
• The math of origami | **Read: Rethinking Mathematics:**  
1. **Everyone read the Introduction pp. 1-6**  
2. Each partner group will read a chapter and share with whole class:  
   • Chapter 1 pp. 9-15  
   • Chapter 2 pp. 16-20  
   • Chapter 3, pp. 21-25  
   • Ch. 4, pp. 26-29  
   • Ch. 5 pp. 30-41  
   • Ch. 6: pp. 42-51  
   • Chapter 7  
   • Ch. 8, pp. 61-66  
“Willing to be Disturbed” (Wheatley) |
| M April 22 | Trigonometry – Global Math Story Calculus – Rethinking Mathematics:  
Integrals and Equity (pg. 181) | For High School Teachers, Choose one article to Read:  
1) “Practices, beliefs and cultures of high school mathematics departments: understanding their influence on student advancement” (Gutierrez, 1996)  
2) “Gaining Traction, Gaining Ground: How Some High Schools Accelerate Learning for Struggling Students (Education Trust, 2005) |
| W April 24 | Lesson Presentations: Choose Global Math Story or Culturally Relevant Lesson based on your Community Walk or Getting to Know a Student Interview (May work independently or with a partner) |                                                                      |
| M April 29 | Lesson Presentations: Choose Global Math Story or Culturally Relevant Lesson based on your Community Walk or Getting to Know a Student Interview (May work independently or with a partner) |                                                                      |
| W May 1   | Lesson Presentations: Choose Global Math Story or Culturally Relevant Lesson based on your Community Walk or Getting to Know a Student Interview (May work independently or with a partner) | Bring a family game to next class                                      |
| M May 6   | The Math in Multicultural Games                                             |                                                                      |
| W May 8   | Debrief semester, final exam review                                         |                                                                      |
| W May 15  | Final Exam: Math content portion                                            | Semester Reflection & Annotated Bibliography due by midnight          |