**MAE 4310, FALL 2016, SECTION 09EF**
**Mathematics Content and Methods for**
**Teaching Mathematics in the Inclusive Elementary Classroom Part 2**


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Canvas Course Link: http://lss.at.ufl.edu

## COURSE DESCRIPTION

This course is designed to present an analysis of the content and methods necessary to effectively teach the fractions, measurement, and data analysis strands of mathematics in the inclusive elementary classroom. We will study the fundamental principles that underlie these content areas from an advanced viewpoint, building on knowledge that you bring with you from your K-12 education. In the context of studying these particular mathematical topics, we will explore more generally a variety of ongoing teacher practices that support effective mathematics teaching.

## REQUIRED TEXTS

Van de Walle, J., Karp, K., Lovin, L., Bay-Williams, J. (2013). *Teaching Student-Centered Mathematics: Developmentally Appropriate Instruction for Grades 3-5*. Upper Saddle River, NJ: Pearson Education.

Sowder, J., Sowder, L., Nickerson, S. (2013). *Reconceptualizing mathematics for elementary school teachers, 2nd edition*. New York, NY: W.H. Freeman.

## COURSE OBJECTIVES

- Students will be able to reason mathematically, solve problems, and communicate mathematics effectively, using a variety of representations of mathematical concepts and procedures.
- Students will analyze and participate in instruction that is aligned with the Common Core State Standards for Mathematics (CCSSM), the National Council of Teaching Mathematics (NCTM) Principles and Standards for School Mathematics, and the Mathematics Florida Standards.
- Students will be able to differentiate mathematical instruction for diverse learners including ELLs, Gifted and ESE students.
- Students will be able to use teaching practices that are effective for the mathematics classroom, such as those reflected in the NCTM Effective Mathematics Teaching Practices and English for Speakers of Other Languages (ESOL) Performance Standards.

**COURSE COMPONENT DESCRIPTIONS**

In-Class Participation (15%) - This course will include discussions and activities that require in-class participation. It is expected that you will participate in all aspects of the class in a polite and respectful manner. Failure to attend class, arrive on time, or actively participate in class activities and discussions will result in a negative impact on the participation component of your grade.

Reading Analysis (10%) - Each week, you will be responsible for completing the assigned reading materials. As a member of a small discussion group, you will be required to post a response to the readings every few weeks. When it is not your turn to post the response, you will be responsible for coming to class prepared to share reflections from the readings and the posted response with your group and with the rest of the class.

Homework Problems (5%) - In a typical week you will have several "warm-up" problems about the basic ideas underlying the week's mathematics topic. You may work on these alone or with others, and should bring your answers to class to go over with your peers. You will also be assigned one or two higher-level problems, usually requiring creativity and/or thinking like a teacher, that you will "prepare" for sharing in class.

Math Pal Activity (5%) - You will be expected to write to a math pen pal in an elementary school. This will be arranged through your instructor. The goal of this assignment is to create an ongoing dialogue with a student originating with a math problem (to be provided in class). You will be expected to bring the results of the problem with you to class for discussion and reflect on student thinking based on the readings and classroom discussion. You will analyze the thinking formally in a write-up and submit it.

Website Critique/Comparison (5%) - This assignment will require you to do a comparative analysis of websites that provide resources for educators. You will do critiques of the usefulness of the websites including their potential strengths and weaknesses. You will be required to reflect on the readings and classroom discussions when doing your analysis. This assignment provides you the opportunity to become familiar with the many resources teachers use every day.

Lesson Project (20%) - You and your lesson group will choose an activity that you will use as the basis for explorations early in the semester and eventually develop into a lesson that you will plan, revise, and implement for your peers. The project is an opportunity to experience collaborative planning, implementation of ideas from class including accommodations for ELLs at various levels of language proficiency, collaborative revision, and personal reflection.

Midterm (15%) - The take-home midterm will allow you to demonstrate your knowledge of course topics from the first half of the semester.

Final (25%) - The take-home final will be an opportunity for you to synthesize your knowledge and demonstrate a deeper understanding of the course material. There will be at least one question requiring you to demonstrate that you have been participating in class discussions and activities.

## ATTENDANCE POLICY

- Since a large portion of this class involves group interaction and analysis of classroom mathematics instruction, regular punctual attendance and participation is expected. Repeated tardiness or unexcused absences will result in a reduction of class participation points.
- Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.
- In the unusual event that you will be late or unable to make it to class, please inform instructor prior to class.

## MAKE-UP POLICY

You will be expected to do make-up work for each missed class. It will be your responsibility to speak with a peer about class material and review the posted PowerPoint slides. Instructor will determine an additional assignment based on circumstances.

## GRADE DISTRIBUTION

| Grade | Percent | Grade | Percent |
|---|---|---|---|
| A | 93-100 | C | 73-76 |
| A- | 90-92 | C- | 70-72 |
| B+ | 87-89 | D+ | 67-69 |
| B | 83-86 | D | 63-66 |
| B- | 80-82 | D- | 60-62 |
| C+ | 77-79 | F | 0-59 |

While all students should be capable of earning an A in the course, merely completing the work does not constitute A work. The final determination of a course grade relies primarily on the **quality** of work presented for the various assignments.

See https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx for information on UF grading policies for assigning grade points.

**ESOL INFUSION**

The following domains, standards, and performance indicators from the ESOL Performance Standards are addressed in the content of this course as part of the infused ESOL program in the Unified Elementary Program (PROTEACH).

Domain 4: ESOL Curriculum and Materials Development
Standard 1: Planning for Standards-Based Instruction of ELLs Teachers will know, understand, and apply concepts, research, best practices, and evidence-based strategies to plan classroom instruction in a supportive learning environment for ELLs. The teacher will plan for multilevel classrooms with learners from diverse backgrounds using a standards-based ESOL curriculum.

Performance Indicators Addressed in MAE 4310:
4.1.a. Plan for integrated standards-based ESOL and language-sensitive content instruction.
4.1.c. Plan differentiated learning experiences based on assessment of students' English and L1 proficiency and integrating ELLs' cultural background knowledge, learning styles, and prior formal educational experiences.

For the second week of class, we will read and discuss the following article and later we will read and discuss "Planning, Teaching, and Assessing Culturally and Linguistically Diverse Students," which is chapter 5 in our textbook (Van de Wall et al., 2013).

Wiest, L. (2008). Problem-Solving support for English language learners. Teaching Children Mathematics, 14(8), 479 – 484

These readings will serve as preparation for you to incorporate ideas for accommodating English Language Learners in your lesson plan work for the course, where you will be meeting the ESOL performance indicators. During the lesson plan project you will specifically discuss, write up, and implement (with peers) the accommodations you design for ELL students of particular backgrounds. Additionally, we will collaboratively plan ESOL accommodations in class on a regular basis, and your practicum field experience may provide you with the opportunity to work directly with an ELL student.

| **ESOL Resources** | |
|---|---|
| Training Word Problems | http://www.purplemath.com/modules/translat.htm |
| Challenges for ELL Students in the Mathematics Classroom | https://ells.wiki.farmington.k12.mi.us/Challenges+for+ELLs+in+Math |
| Math Instruction for English Language Learners | http://www.colorincolorado.org/article/math-instruction-english-language-learners |

**UNIVERSITY POLICY ON ACADEMIC MISCONDUCT:** Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code at http://www.dso.ufl.edu/students.php.

**UNIVERSITY POLICY ON ACCOMMODATING STUDENTS WITH DISABILITIES:** Students requesting accommodation for disabilities must first register with the Dean of Students Office (http://www.dso.ufl.edu/drc/). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive, therefore students should contact the office as soon as possible in the term for which they are seeking accommodations.

**ONLINE COURSE EVALUATIONS:** Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

**ASSIGNMENT SCHEDULE**

| Week | Topic | Assignment for next time |
|---|---|---|
| 1 (8/22) | **Introductions** | >>Read and prepare analysis for:<br>--VDW ch. 2 on teaching mathematics through problem solving.<br>--"Problem-Solving Support for English Language Learners" article.<br>>>Read Mathematical Task case study and prepare responses to questions. |
| 2 (8/29) | **Problem Solving, Meanings for Fractions, Supports for ELLs, Assessment** | >>Read and prepare analysis for:<br>--VDW ch. 3 on assessment<br>--VDW ch. 12 pgs. 202-228 on meanings for and comparing fractions.<br>>>Do Sowder p. 104 #3, 6, and p. 113 #6, 13, and prepare VDW p. 208 Activity 12.1, plus designing a similar activity with Cuisenaire rods and prepare an approach for p. 123 #9.<br>>>Submit initial activity for Lesson Plan group.<br>>>Write initial math pal letter. |

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| 3 (9/12) | **Estimating Fractional Values, Addition and Subtraction of Fractions** | >>Read and prepare analysis for:<br>--VDW pgs. 231-242 from ch. 13 on fraction addition and subtraction.<br>>>Do Sowder p. 129 #2, 3, and prepare problems for p. 130 #14.<br>>>Begin Website Project. |
| 4 (9/19) | **Diverse Students, Addition and Subtraction of Fractions** (cont.) | >>Read and prepare analysis for:<br>--VDW ch. 5 on planning, teaching, and assessing for diverse students<br>--"Fractions: What Happens between Kindergarten and the Army?" article.<br>>>Complete Website Project. |
| 5 (9/26) | **Planning for Culturally and Linguistically Diverse Students, Multiplication and Division of Fractions** | >>Read and prepare analysis for:<br>--VDW pgs. 242-253 from ch. 13 on fraction multiplication and division.<br>>>Do Sowder p. 134 #1, 5 and p. 141 #1, 5, and prepare problems for p. 142 #15.<br>>>Begin initial lesson plan, including observation of practicum student. |
| 6 (10/3) | **Relating Fractions, Decimals, and Percents** | >>Read and prepare analysis for:<br>--VDW ch. 14 on decimal and percent concepts and computation.<br>--Sowder pgs. 114-118 and 161-163.<br>>>Do Sowder p. 118 #1, 13 and p. 166 #1 and prepare your own problem like p. 167 #10.<br>>>Complete initial lesson plan. |
| 7 (10/10) | **Review and Enrichment** | >>Read and prepare analysis for:<br>--VDW ch. 6 on planning, teaching, and assessing for students with exceptionalities.<br>>>Do take-home midterm exam. |
| 8 (10/17) | **Measurement Basics** | >>Read and prepare analysis for:<br>--VDW pgs. 312-324 from ch. 16 on the meaning of measurement.<br>--"STEM Gives Meaning to Mathematics" article.<br>>>Do Sowder p. 521 #1, 8, and p. 530 #5 and prepare a plan for how you would transition students to a new meaning for one of the words in #40. |
| 9 (10/24) | **Measurement Concepts– Area, Surface Area, and Volume** | >>Read and prepare analysis for:<br>--VDW pgs. 324-334 from ch. 16 on area and volume.<br>--"Do Your Students Measure Up?" article.<br>>>Do Sowder p. 547 #1, 11, and p. 556 #1 and prepare #17.<br>>>Revise lesson plan. |
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| 10 (10/31) | **Measurement-- Connections to Formulas and More Attributes** | >>Read and prepare analysis for:<br>--VDW pgs. 335-343 from ch. 16 on other attributes.<br>--Sowder pgs. 565-571 on developing formulas.<br>>>Do Sowder p. 571 #2, p. 531 #14, p. 581 #2 and prepare p. 572 #8, including possible activities you could ask students to do to explore this. |
| 11 (11/7) | **Probability**<br><br>Peer teaching I | >>Read and prepare analysis for:<br>--Sowder pgs. 604-617 on probability concepts and pgs. 657-663 on sampling.<br>>>Do Sowder p. 617 #9 and p. 665 #5, and prepare p. 666 #5. |
| 12 (11/14) | **Probability**<br><br>Peer teaching II | >>Read VDW ch. 18 on helping students represent and interpret data and Sowder pgs. 675-677 and 681-685.<br>>>Do Sowder p. 678 #1, p. 685 #1, and prepare p. 679 #9. |
| 13 (11/21) | **Introduction to Statistics** | >>Read and prepare analysis for:<br>--"Statistics at Play" article.<br>--Sowder pgs. 688-692 and pgs. 697-700.<br>>>Do Sowder p. 693 #1, 6 and p. 701 #1, 2, and prepare p. 695 #10.<br>>>Write Lesson Plan Reflection. |
| 14 (11/28) | **Representing and Interpreting Data with One Variable** | >>Read and prepare analysis for:<br>--"Zoos, Aquariums, and Expanding Students' Data Literacy" article.<br>--Sowder pgs. 704-707 and pgs. 709-715.<br>>>Do Sowder p. 708 #4, p. 716 #3, 6, and prepare p. 716 #2. |
| 15 (12/5) | **Review for Final** | >>Take-home final exam. |