Course Syllabus: EDUC 433/633 Teaching Elementary Mathematics

FALL 2013
MONDAY 1:00-3:45
WRB 2021

EDEL 433/633 METHODS FOR TEACHING PK-8 MATHEMATICS
Lecture Lab: 3+0
Credit(s): 3

Mathematical and psychological bases for scope, sequence and appropriate instructional strategies in pre-K, elementary and middle school mathematics.

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University of Nevada, Reno

Office hours: Mondays and Thursdays 11-12 or by appointment
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Course Objectives:

The purpose of course is for you to examine the Common Core Standards, research on mathematics teaching and learning, and to develop math teaching skills to support students learning. You will learn how to teach mathematics efficiently and effectively by using the Common Core Standards of Mathematical Practices as a natural part of your teaching.

You will be expected to know the major mathematical ideas that are included in the Common Core standards, elementary and middle school curriculum and the approximate grade levels at which they are introduced. You will also be expected to know how different types of models and materials can be used to support student learning. You will explore how students learn mathematics by focusing on student thinking. Assessment plays an important role in understanding what students are learning and how they are learning. Therefore, your decisions as a teacher to support student learning should be informed by your ongoing assessments of students’ mathematical reasoning. You will be expected to understand how children construct increasingly sophisticated mathematical ideas. You will be expected to use this knowledge when planning for instruction. Specific skills you will develop are listed below:
• Deepen your understanding of content knowledge and Pedagogical Content knowledge in specific math topics outlined in Van de Walle book and Common Core standards.
• Gain insights into children’s’ mathematical thinking and how they learn math?
• Understand the process of setting up a classroom environment, planning and facilitating lessons to support mathematical learning.
  o Understand student Learning Trajectories: Building Bridge between what students know and what teachers should teach?
  o Strategies to support learning: E.g. Good questioning techniques
  o Learn how to plan lessons using Common Core Standards and Curriculum that support mathematical thinking and learning.
  o Understand formative and summative assessment
• Develop ability to professionally notice math learning.

*UNR Conceptual Framework.

This course incorporates the conceptual framework of the College of Education at the University of Nevada Reno. The italicized text in this syllabus represents the conceptual framework. See attachment of the conceptual framework.

REQUIRED TEXTBOOKS:

ELEM&MID SCH MTH SVE&NEW MEL&WHOLE CLSS PKG

This package contains:

• Elementary and Middle School Mathematics: Teaching Developmentally, Student Value Edition, 8/E
  Van de Walle, Karp & Bay-Williams

• NEW MyEducationLab with Pearson eText -- Standalone Access Card -- for Elementary and Middle School Mathematics: Teaching Developmentally, 8/E
  Van de Walle, Karp & Bay-Williams
  ©2013 • Access Code Card

• Whole Class Mathematics Discussions: Improving In-Depth Mathematical Thinking and Learning
COPY OF COMMON CORE STANDARDS
You can download a copy of the new Common Core Standards:
http://www.corestandards.org/the-standards/mathematics

MYEDUCATIONLAB COURSE ID: lamberg87085

You will need to create an account in MyEducationLab using the access code that you purchased and then join the course using the CourseID. I don’t get to see your work unless you joined the course.

WHOLE CLASS MATHEMATICS DISCUSSIONS PD TOOLKIT: The book comes with an access code for the PD Toolkit. The PD Toolkit contains, PowerPoints, downloadable worksheets etc. that we will be using in class.

WHOLE CLASS MATHEMATICS DISCUSSION BLOG
http://mathdiscussions.wordpress.com/

This blog contains many resources for you to use for understanding the Common Core standards as well as planning lessons.

COURSE FORMAT (Love of Learning):

This course will be a combination of online work, lecture, discussion and hands on activities. Therefore it is necessary that you come to class prepared for discussion and to participate in activities.

COURSE REQUIREMENTS AND ASSIGNMENTS:
Details of each assignment will be provided in class. The following is the breakdown of possible points that you could earn for each assignment:

- Practicum Assignment with ELC Students: Lesson Plans, Pre and Post Test, & Reflections 30 points (Knowledge of subject matter and planning and knowledge of students.)

You will be working with ELC elementary students for 30 minutes during class for a total of 6 times. You will develop a pre and post test, a unit plan and develop
4 lesson plans to support student learning using the tools from the Whole Class Discussion book. These lessons will be aligned with the content we are studying in the Van De Walle book. The purpose of this assignment is designed to help you gain first hand experience getting insights into how students think and learn. Specifically, you will learn how to assess and adapt the lesson to support learning. This assignment will help you gain experiences on the process of teaching.

Teaching Math Content: Assignments Related to Van de Walle Course Chapter readings: 30 points. (Your cumulative grade will be converted into 30 points out of 100.)

Please complete multiple choice chapter Tests from MyEducationLab School for chapters 8-21. The course syllabus outlines topics that will be discussed each day. You may take the quiz twice. (I am able to track how many times you take the quiz). You need to read the textbook and reflect on the information presented in order to get most out of this course. Otherwise you are cheating yourself the knowledge you will gain from taking this class to become a great teacher! Make sure you read the chapter prior to class- Make an outline of your notes from each chapter. Take the quiz after we have discussed each chapter in class. The Learning Outcome section of MyEducationLab contains videos and samples of curriculum. I suggest that you look as you study your chapters.

Math Lesson and Research Paper are part of one larger assignment 40 points

PLEASE USE RESOURCES IN LRC FOR THIS ASSIGNMENT
The purpose of this assignment is to familiarize you with the research and related resources that exist for teaching a math concept. In addition, you will get to think about the sequencing and how you might use this unit to plan whole class lessons.

• Research Paper (Strong fund of knowledge)

You will be required to research a math topic in an area that you find interesting and write a 3 page research paper. In this paper, you will answer the following questions: You can create a list or chart to answer the following questions:

1. What does the research say what it means to understand the topic. Make sure you include the related Common Core standards.
2. What does the research say about how students think about that particular topic? What kinds of errors or misconceptions might happen? Refer to page 103 on Whole Class discussion Figure 5.3. Create a chart of list of inefficient to more sophisticated strategies of ways of reasoning. What is the continuum of understanding?
3. What are some suggestions for teaching the topic?
4. Create a concept Map. – Refer to Chapter 4: Whole Class Mathematics Discussion.

Masters students will be required to use a minimum of 7 references and write a 5 page paper instead of a 3 page paper.

- **Analysis of Curriculum.** 2-3 pages double spaced *(knowledge of subject matter and planning)*

Find a curriculum related to your topic. You can use Investigations, Envision, Everyday Math, Illuminations etc… You will examine this curriculum from a perspective of a teacher who is required to teach the particular unit. Create a Unit plan for 4 lessons. Identify how the lessons build on each other.

**Critique the curriculum:**
Is this a good curriculum to teach the concept? Why or why not? What would you modify, how and why?

- **Reflection on Whole Class Discussion.** (Please refer to book)
  - Pick one lesson and discuss a problem you might discuss
    - What would be the big idea you might want to get across. How would you use teacher questioning and three levels of sense making to get students to make mathematical connections?
    - What is the role of classroom routines and environment for supporting the discussion and mathematical learning?

**Grading**

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<tr>
<th>Grade</th>
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<td>A</td>
<td>98 -100</td>
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<td>A</td>
<td>94 - 97</td>
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<td>A-</td>
<td>90-93</td>
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<td>B+</td>
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<td>B</td>
<td>84-88</td>
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<td>B-</td>
<td>80-83</td>
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<td>C+</td>
<td>78- 79</td>
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<td>C</td>
<td>74-76</td>
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<td>C-</td>
<td>70-73</td>
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<tr>
<td>D</td>
<td>60-69</td>
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<td>F</td>
<td>BELOW 59</td>
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*Requirements for Research paper for Master students will be discussed in class*
This course will be treated as a professional commitment. Therefore, attendance, punctuality and completion of all assignments are expected. Students must notify the course instructor and teacher prior to any absence/late arrival.

Attendance is required. Failure to attend (or make-up an absence) will result in lowering your final course grade by one entire letter grade (ex: B to C).

Tardiness: We have a very limited time period to meet as a class. Coming in late is disruptive for your classmates. Therefore, it is critical that you attend the class on time. If you are tardy more than 10 minutes, your final grade will be lowered half a grade (e.g. B+ to a B). You will not be penalized for tardiness under special emergency circumstances that is approved by the instructor.

**Time Commitment:**

According to the definition in the University of Nevada, Reno catalog, one credit is “defined as 3 hours of work per week for one semester. Usually this work is made up of one period in class plus 2 hours of preparation for lecture-seminar class” (P. 309). Thus, for a 3 credit class you would expect for every 3 hour meeting the student is expected to complete 6 hours of preparation. In a class occurring during an academic year semester, this formula then equates to an average of 9 hours per week devoted to class work (a combination of in-class time.

University of Nevada - Reno Statement on Academic Honesty (Domain 5):
* from the New Student Orientation Handbook available at: http://www.unr.edu/stsv/nsop/dishones.htm

**Disability**

Each student who qualifies with a disability is to provide his or her instructor with a letter from the Disability Resource Center (DRC) stating the appropriate accommodations for this course. If you have a documented disability and wish to discuss how these academic accommodations will be implemented for this course, please contact the instructor as soon as possible.

**Disability Services:** "Any student with a disability needing academic adjustments or accommodations is requested to speak with the Disability Resource Center (Thompson Building, Suite 101) as soon as possible to arrange for appropriate accommodations." For more details, go to [http://www.unr.edu/drc](http://www.unr.edu/drc). Also, please meet with UNR supervisors at your earliest convenience to ensure timely and appropriate accommodations.

**Academic Dishonesty:** *Academic dishonesty* is defined as cheating, plagiarism or otherwise obtaining grades under false pretenses. *Plagiarism* is defined as submitting the language, ideas, thoughts or work of another as one’s own; or assisting in the act of plagiarism by allowing one’s work to be used in this fashion. “The work of another” does
not just mean whole papers or articles copied from another source. It includes any
information, ideas, sentences, or phrases that came from somewhere other than your own
head (i.e., books, articles, internet sites, videos, documents, lecture notes or handouts
from other courses, and any other sources used in your work). These must be properly
acknowledged by providing references either in the text or in a footnote, along with end
references giving the complete publication information for all sources used in your work.
Even if you paraphrase someone else’s ideas and do not quote them directly, you still
must acknowledge your source.

Disciplinary procedures for incidents of academic dishonesty or plagiarism may involve
both academic action and administrative action for behavior against the campus
regulations of student conduct….Academic action may include: (1) canceling the
student’s enrollment in the class without a grade; (2) filing a final grade of “F”; (3)
awarding a failing mark on the test or paper in question; (4) requiring the student to
retake the test or resubmit the paper. For more details, see the UNR General Catalog.

**Academic Services:** Academic Success Services: Your student fees cover usage of the
Math Center (784-4433 or [www.unr.edu/mathcenter/](http://www.unr.edu/mathcenter/)), Tutoring Center (784-6801 or
[www.unr.edu/tutoring/](http://www.unr.edu/tutoring/)), and University Writing Center (784-6030 or
[www.unr.edu/writing_center](http://www.unr.edu/writing_center)). These centers support your classroom learning; it is your
responsibility to take advantage of their services. Keep in mind that seeking help outside
of class is the sign of a responsible and successful student.

**Statement on Audio and Video Recording:** “Surreptitious or covert video-taping of
class or unauthorized audio recording of class is prohibited by law and by Board of
Regents policy. This class may be videotaped or audio recorded only with the written
permission of the instructor. In order to accommodate students with disabilities, some
students may be given permission to record class lectures and discussions. Therefore,
students should understand that their comments during class may be recorded.”

As is true for all of the work you do for all of your classes, your instructor and others
may review your work while evaluating the quality of courses and programs. However,
your work cannot be used for any research projects without written approval from the
UNR Office of Human Research Protection.

**Mathematics Resources**

CA: Marilyn Burns Education Associates.

*Children’s mathematics: Cognitively guided instruction*. Portsmouth, New Hampshire:
Heinemann.


ERIC data base – Education data base accessible through library website

**Research Journals**
- Educational Studies in Mathematics
- Focus on Learning Problems in Mathematics
- International Journal of Mathematical Education in Science and Technology
- Journal for Research in Mathematics Education
- Journal of Mathematics Teacher Education
- Mathematics Education Research Journal
- Mathematical Thinking and Learning
- Review of Educational Research
- The Journal of Mathematical Behavior

**School Journals**
- Mathematics Teacher
- School Science and Mathematics
- Teaching Children Mathematics
- Teaching Mathematics in the Middle School

**Other periodical publications**
- Yearbook of the National Council of Teachers of Mathematics

**WEBSITES**

Math Education Website:


Nevada Common Core Standards –This contains information for Nevada Teachers

[https://bighorn.doe.nv.gov/sites/CommonCore/default.aspx](https://bighorn.doe.nv.gov/sites/CommonCore/default.aspx)
Course Schedule

The Van De Walle chapters need to be read prior to our class discussions. The Learning Outcome and assessment activities must be done prior to class discussion. Chapter Test must be completed after we discuss the topic in class. This way, any questions will be answered in class.

<table>
<thead>
<tr>
<th>Date</th>
<th>Class Activity</th>
<th>Assignments</th>
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| 8-26  | Introductions: Chapter 1: Teaching Mathematics in the 21st Century  
Chapter 2: Exploring what it means to do Mathematics Introductions | Note: Chapter Readings from both books need to be completed PRIOR to the day it will be discussed. **Van de Walle Chapter quizzes should be taken in the same week after we have discussed the topic in class.**  
Read Chapters 8 **Van de Walle**  
Read Whole Class Discussions: Chapter 1 - 3 |
| 9-2   | Labor Day- No Class                                                            |                                                                                                                                           |
| 9-9   | Chapter 8 Developing Early Number Concepts and Number Sense  
Chapter 3: Teaching through Problem Solving | Take Chapter 8 Test **MyEducationLabSchool**  
Van de Walle -Read Chapters 9 &10                                                                                                          |
| 9-16  | Chapter 9: Developing Meaning for the Operations.  
Chapter 10: Helping Children Master Basic | Take Chapter 9 & 10 Test **MyEducationLabSchool**  
Read Van de Walle Chapter 11                                                                                                                 |
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<thead>
<tr>
<th>Date</th>
<th>Chapter/Section</th>
<th>Action</th>
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<tbody>
<tr>
<td>9-23</td>
<td>Chapter 11: Developing Whole-Number Place Value concepts</td>
<td>Take Chapter 11 Test MyEducationLabSchool</td>
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<td>Chapter 6: Teaching Mathematics Equitably to All Children</td>
<td>Read Whole Class Discussions: Chapter 4 &amp; 5</td>
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<td><strong>DEVELOP PRE-TEST</strong></td>
<td>Read Van de Walle Chapter 12</td>
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<td>9-30</td>
<td>Chapter 12: Strategies for addition and subtraction</td>
<td>Take Chapter 12 Test MyEducationLabSchool</td>
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<td>*Work with Children from the Early Learning Center- Pre-Test and Lesson Plan 1</td>
<td>Read Van de Walle Chapter 13</td>
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<td><strong>Develop Lesson Plan 1 in Class –Refer to Whole Class Discussion and Pre-test</strong></td>
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<td>10-7</td>
<td>Chapter 13: Using Computational Estimation with Whole Numbers</td>
<td>Take Chapter 13 Test MyEducationLabSchool</td>
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<td>Chapter 5: Building Assessment into Instruction</td>
<td>Read Van de Walle Chapter 14</td>
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<td>*Work with Children from the Early Learning Center- Lesson Plan 2</td>
<td>Develop Lesson Plan 2</td>
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<td>10-14</td>
<td>Chapter 14: Algebraic thinking: Generalizations, Patterns and Functions</td>
<td>Take Chapter 14 Test</td>
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<td>Explore how to look at a Curriculum unit and make a concept map</td>
<td>Develop Lesson Plan 3</td>
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<td>*Discuss Chapter 6</td>
<td>Read Van de Walle Chapter 15</td>
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<td>*Work with Children from the Early Learning Center- Teach Lesson Plan 3</td>
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<td>10-21</td>
<td>Developing fraction concepts Chapter 15</td>
<td>Starts working on Research paper- identify topic &amp; reference</td>
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<td>*Discuss Chapter 6</td>
<td>Take Chapter 15 Test</td>
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<td>*Work with Children from the Early Learning Center- Teach Lesson Plan 3</td>
<td>MyEducationLabSchool</td>
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<td>Read Chapters 16</td>
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<td></td>
<td>Develop Lesson Plan 4</td>
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<td>Date</td>
<td>Chapter 16</td>
<td>Chapter 17</td>
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<td><em>Work with Children from the Early Learning Center- Teach Lesson Plan 4 and posttest.</em></td>
<td><em>Work with Children from the Early Learning Center- Teach Lesson Plan 4 and administer Post Test</em></td>
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<tr>
<td>11-4</td>
<td>Teach Lesson Plan 4 and administer Post Test</td>
<td>Take Chapter 17 Test</td>
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<tr>
<td>11-18</td>
<td>Take Chapter 17 Test</td>
<td>Take Chapter 18 Test</td>
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<tr>
<td>11-25</td>
<td>Read Van de Walle Chapter 17</td>
<td>Read Van de Walle Chapter 18</td>
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<td>12-2</td>
<td>Take Chapter 21 Test</td>
<td>Take Chapter 21 Test</td>
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<td>12-9</td>
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<td>12-16</td>
<td><em>Wrap up</em></td>
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<td><em>Final Exam:</em></td>
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