This syllabus is subject to change as needed. Any changes to the syllabus will be announced in class.

No cellular phones or beepers are permitted in class.

If you have or suspect a disability and need accommodations you should contact Disabled Student Services (DSSO) at 747-5148 or at dss@utep.edu or come by Room 106 Union East Building.

Required Texts


- Addington, S., & Dennis, D. (2013). *Measuring the World: Mathematics for Elementary and Middle School Teachers*. Published by the authors. Available: Chapters will be provided on the course website via Blackboard

- Geogebra: Dynamic Software for Everyone [v. 4.4]. Available: www.geogebra.org. This is FREE, open-source software for both Mac and Windows platforms.

- Other necessary handouts and/or readings will be passed out in class. All course handouts will be made available on Blackboard (through my.utep.edu). You MUST have a valid UTEP login and password to access my.utep.edu, Blackboard, and many other relevant UTEP websites. A UTEP e-mail address is required for all e-correspondence and more effective communication.

Recommended Resources for Middle School Mathematics:

- NCTM Illuminations: http://illuminations.nctm.org/
- Early Algebra: www.ase.tufts.edu/education/earlyalgebra/default.asp
- Annenberg Media: http://www.learner.org/index.html
- Science NetLinks: http://www.sciencenetlinks.com/

Policy on Academic Dishonesty

The University of Texas at El Paso prides itself on its standards of academic excellence. In all matters of intellectual pursuit, UTEP faculty and students must strive to achieve based on the quality of work produced by their individual. In the classroom and in all other academic activities, students are expected to uphold the highest standards of academic integrity. Any form of scholastic dishonesty is an affront to the pursuit of knowledge and jeopardizes the quality of the degree awarded to all graduates of UTEP. It is imperative, therefore, that all faculty, insist on adherence to these standards.

Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes, but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are not attributable in whole or in part to another person, taking an examination for another person, and any act designed to give unfair advantage to a student or the attempt to commit such acts. Proven violations of the detailed regulations, as printed in the Handbook of Operating Procedures (HOP) and available in the Office of the Dean of Students, may result in sanctions ranging from disciplinary probation, to failing grades on the work in question, to failing grades in the course, to suspension or dismissal among others.
Course Framework

Students enrolled in this course will explore the methods of teaching mathematics in intermediate and middle grades. Emphasis is placed on the equity principle (mathematics for all) and development of conceptual understanding of topics such as real numbers and operations on real numbers, geometry, statistics and probability, and algebra (patterns, variables, and functions).

We will reflect upon our own experiences and beliefs about mathematics. We will look at mathematics as a discipline, and compare more traditional ideas about what it means to ‘know’ and ‘do’ mathematics to the vision of mathematics advocated by the reform movements as well as what it means to ‘know’ and ‘do’ mathematics relying on constructivist principles of learning and teaching.

Course Objectives

Upon completion of the course, students will be better prepared to:

- Identify what makes a ‘good mathematical task’, and how can a good task support students’ learning
- How children can make sense of several key mathematics concepts
- How tools (including manipulatives, calculators, and other technology) assist children in their thinking and problem solving
- Identify their role as teacher in a math classroom
- Plan and implement a mathematics lesson based upon constructivist principles of learning and teaching
- Adjust lessons and instruction based on what they learn from their students

<table>
<thead>
<tr>
<th>Standard</th>
<th>Student Learning Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard V. Mathematical Processes: The mathematics teacher understands and uses mathematical processes to reason mathematically, to solve mathematical problems, to make mathematical connections within and outside of mathematics, and to communicate mathematically.</td>
<td>Apply content knowledge to construct a mathematical model of a real-world situation, analyze and evaluate how well the model represents the situation based on results.</td>
</tr>
<tr>
<td>Standard VI. Mathematical Perspectives: The mathematics teacher understands the historical development of mathematical ideas, the interrelationship between society and mathematics, the structure of mathematics, and the evolving nature of mathematics and mathematical knowledge.</td>
<td>Use mathematics to model and solve problems in other disciplines to show the integration and the relevance of mathematics to the linguistic, cultural, and socioeconomic background of students</td>
</tr>
<tr>
<td>Standard VII. Mathematical Learning and Instruction: The mathematics teacher understands how children learn and develop mathematical skills, procedures, and concepts, knows typical errors students make, and uses this knowledge to plan, organize, and implement instruction; to meet curriculum goals; and to teach all students to understand and use mathematics.</td>
<td>Apply theories and principles of learning mathematics to plan and implement developmentally appropriate and effective instructional activities for all students</td>
</tr>
<tr>
<td>Standard VIII. Mathematical Assessment: The mathematics teacher understands assessment and uses a variety of formal and informal assessment techniques appropriate to the learner on an ongoing basis to monitor and guide instruction and to evaluate and report student progress.</td>
<td>Select or design and administer a variety of appropriate assessment instruments and/or methods (e.g., formal/informal, formative/summative) to monitor student understanding of mathematics and progress over time</td>
</tr>
<tr>
<td>Standard IX. Professional Development: The mathematics teacher understands mathematics teaching as a profession, knows the value and rewards of being a reflective practitioner, and realizes the importance of making a lifelong commitment to professional growth and development.</td>
<td>Become life-long learners who renew their skills by critically and effectively reflecting upon, evaluating, and implementing research-based materials in the mathematics classroom.</td>
</tr>
</tbody>
</table>
Texas Pedagogical Standards


Texas Math Standards and National Standards

- All TEKS, Texas Essential Knowledge and Skills, for all grades and subjects can be found at this website: http://ritter.tea.state.tx.us/rules/tac/chapter111/index.html
- Curriculum Focal Points: http://www.nctm.org/focalpoints.aspx

Assessment


Course Requirements

- It is expected that students will attend all classes and actively participate in working on projects and class discussions. Students are expected to prepare for each class session. Lateness to class is strongly discouraged. With the emphasis on collegiality it is important that all group members be in class to contribute to the group’s effort in developing an understanding of what it means to teach mathematics effectively.
- Assignments are due on the specified dates. Late assignments will not be accepted.
- The schedule of topics and reading assignments may change over the course of the semester. Any changes to the syllabus will be announced in class. Every student is responsible for these changes whether or not the student is present in class.
- Type or word-process written assignments. All assignments should be double spaced with a 12-point font. Number your pages.

Attendance Policy

There will be a student sign-in sheet at the beginning of each class. If a student misses a session, it is the responsibility of the student for knowing and completing all work required. Each attendance will count towards the final grade. Two tardies (including early leaves) will count as one absence. More than two absences may result in a student earning one-letter grade lower in the course.

Course Assignments

1. Lesson/Microteaching Project (2 parts)

As part of this course, you will have opportunities to take part in the Professional Learning Community of math instructors at Alderete MS. You will be required to create a lesson plan for a given topic that meets the following criteria: 1) it is appropriate for grades 6 – 8, 2) it utilizes the 5E pedagogy, and 3) it is aligned with STAAR objectives as well as TEKS standards. You will present your lesson in a microteaching activity to a group of Alderete Middle school students during our regularly scheduled class period. Topics will be approved and finalized by me. Topics will be approved and finalized by me. You will receive constructive feedback in the form of written analysis from me. At the end of the semester you will receive copies of ALL lesson plans and ALL feedback for your own use and reference (in a type of portfolio).

Part 1. Working in groups of two, you will prepare a written lesson plan to be submitted for a grade. This will be submitted before you actually teach the lesson. The format for the lesson plan will be discussed in class and a guide is provided on page 6 of this syllabus.

Part 2. Each team will be assigned at random to introduce/implement their lesson plan on a date specified in class. You will distribute copies of your lesson to each member of the class, and you will submit an electronic copy of your final lesson (including any PowerPoint slides and handouts) to me via e-mail. Lessons should be 50 minutes in length, based on the
**typical middle school schedule.** If you have any need for manipulatives or other teaching material, please inform me before you teach your lesson (at least TWO DAYS IN ADVANCE).

2. **Homework assignments**

There will be short homework assignments, primarily skills-based, throughout the semester. They will be due the following week **without exception**. Assignments will be announced and passed out in class and due dates will be determined. The homework assignments will reflect not only the appropriate mathematics content for grades 4-8 but also the content you should expect to see on your certification test.

3. **Activity Evaluation**

You will locate a lesson/activity via a list of resources that I will provide to you (e.g. Illuminations website, Connected Mathematics Project, etc). I will provide you with ideas throughout the semester. Drawing from your experience in your mentor school, the Van de Walle textbook, and your own lived experiences, present a thoughtful analysis on the strengths and shortcomings of how this activity responds to (in theory and in practice) what you consider the main issues:

- What is the content being addressed or taught?
- Based on what you believe to be the developer’s intention, what would you change and why?
- What implications would your change (or changes) have on future learning and/or practice?

Each person will be responsible for writing a minimum three (3)-page evaluation paper on their chosen activity/lesson. A rubric is provided on page 9 of this syllabus. This assignment will be turned in during exam week.

**Grades**

In this course all grades are important, but some assignments take more time and thought so therefore some may have a different weight.

- **Class Participation/Attendance** 15%
- **Activity Evaluation** 15%
- **Homework Assignments** 30%
- **Lesson/Microteaching Plan & Implementation** 40%

Final grade is first determined by a weighted average, based on the number of points each of the above is worth. Second, the result of the weighted average is converted to a percentage.

**Grade Distribution:**

<table>
<thead>
<tr>
<th>Grade</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93-100</td>
</tr>
<tr>
<td>B</td>
<td>85-92</td>
</tr>
<tr>
<td>C</td>
<td>75-84</td>
</tr>
<tr>
<td>D</td>
<td>65-74</td>
</tr>
<tr>
<td>F</td>
<td>0-64</td>
</tr>
</tbody>
</table>
General calendar – Topics, chapters, and dates are subject to change. Due dates for homework assignments will be announced in class.

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic/Issue*</th>
<th>Activity Focus</th>
<th>Assignment</th>
</tr>
</thead>
</table>
| August 26    | • Introduction to the course  
• Chapter 1 – Teaching Mathematics Through Understanding  
• Chapter 2 – Teaching Mathematics Through Problem Solving  
• The 5E pedagogy | 1. What is “doing” Math?  
2. Constructivism |                                               |
| September 2  | • Chapter 8 – Fraction Concepts and Computation  
• Chapter 9 – Decimal Concepts and Computation | 1. Fraction number sense  
2. Equivalent fractions  
3. Algorithms  
4. Fractions, decimals, and percents |                                               |
| September 9  | • Chapter 10 – The Number System | 1. Integers  
2. Exponents | Homework 1 Due |
| September 16 | • Chapter 14 – Exploring Measurement Concepts  
• Chapter 13 – Developing Geometry Concepts | 1. Length and perimeter  
2. Volume  
3. Geoboards and mathematical space |                                               |
| September 23 | • Chapter 13 – Developing Geometry Concepts | 1. Area  
2. Symmetry | Homework 2 Due |
| September 30 | • Chapter 11 – Developing Concepts of Ratio and Proportion | 1. Comparing ratios  
2. Solving proportions  
3. Foundations of trigonometry |                                               |
| October 7    | • Chapter 15 – Working with Data and Doing Statistics | 1. Representations  
2. Descriptive Statistics | Homework 3 Due |
| October 14   | • Chapter 16 – Investigating Concepts of Probability | Theoretical and Experimental Probability |                                               |
| October 21   | • Chapter 12 – Exploring Algebraic Thinking, Expressions & Equations | 1. Sequences and patterns  
2. Variables  
3. Function reasoning  
4. Constructing formulas | Homework 4 Due |
| October 28   | • Chapter 12 – Exploring Algebraic Thinking, Expressions & Equations | 1. Functions and modeling  
2. Graphing  
3. The coordinate plane |                                               |
| November 4   | MICROTEACHING* |                                               | Homework 5 Due |
| November 11  | MICROTEACHING |                                               |                      |
| November 18  | MICROTEACHING |                                               |                      |
| November 25  | THANKSGIVING WEEK – NO CLASS |                                               |                      |
| December 2   | MICROTEACHING |                                               |                      |
| December 11  | Exam Week |                                               | Activity Evaluations DUE |

*Chapters 3, 4, 5, & 6 will be covered and referenced throughout the course as you work on designing your lessons and pedagogy.
Lesson Plan Guide

The lesson plan should be typed and roughly 2-3 pages long. Design a lesson that will build on and extend students' understanding of a chosen math topic in some meaningful way. Your students need to be actively thinking during your lesson. You should strive to keep students mentally active. Teach through problem solving/inquiry. Refer to your Van De Walle textbook or any other resource(s) as needed. Your lesson plan should be something that is useful to you as you teach the lesson. It should include information that helps others understand your thinking behind your planning. The plan should include at least the following:

- **Title.**
- **Grade level.**
- **Goals** of your lesson. Be as specific as possible. Include the specific ideas and processes you hope to help your students develop and/or understand.
- **TEKS Standards/STAAR alignment** – Provide specific, standard expectations for teaching the selected concept/procedures for selected grade level. Identify and provide specific, related STAAR questions for the standard expectations.
- **Materials and Resources** needed for the lesson.
- **Instructional Sequence**: a chronological plan that outlines what happens first, second, third, and so forth. This should include at least the following (don't forget to put an estimate of the time needed for each part of the lesson):

  1. An introduction to the lesson (setting the task(s))
  2. The task(s)/activities you will use.
  3. Group work and/or individual work.
  4. Whole class discussion (group presentations)
  5. Extension and overview (closure).

- **Assessment techniques** you plan to use during the lesson. Describe what you will do during the lesson to assess student understanding. Describe what you will do with the materials produced (e.g., will you mark questions as you walk around, will you collect journals and write comments, will you evaluate group presentations with a rubric?) Attach copies of any written assessments (tests, rubrics, observational checklists, format for anecdotal records).
<table>
<thead>
<tr>
<th></th>
<th><strong>Exceeds Expectation</strong></th>
<th><strong>Meets Expectation</strong></th>
<th><strong>Does Not Meet Expectation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lesson Goals</strong></td>
<td>Goals are highly relevant and aligned well with topic. Goals align with standards for middle school math curriculum or school district scope and sequence.</td>
<td>Goals may tend to be more skills-based rather than conceptual-based. Some goals may not be appropriate for grade level specified.</td>
<td>Goals are not clearly identified and/or are not aligned to middle school math curriculum, standards, and scope and sequence.</td>
</tr>
<tr>
<td><strong>5 pts.</strong></td>
<td></td>
<td>3 – 4 pts.</td>
<td>0 – 2 pts.</td>
</tr>
<tr>
<td><strong>Standards Alignment</strong></td>
<td>Standards are aligned well to lesson and clearly identified.</td>
<td>Standards listed are only partially aligned to topic but most relevant standards have been identified.</td>
<td>No standards are identified and/or most relevant standards are missing.</td>
</tr>
<tr>
<td><strong>5 pts.</strong></td>
<td></td>
<td>3 – 4 pts.</td>
<td>0 – 2 pts.</td>
</tr>
<tr>
<td><strong>Introduction to Lesson</strong></td>
<td>“Setting up the task” is clear – expectations of students are well described and presented. Students are well aware of expectations. Expectations are fully aligned with goals.</td>
<td>“Setting up the task” is brief but “works.” Students are aware of expectations but some confusion is still evident. Some slight misalignment with goals is evident.</td>
<td>Expectations of students are not described or presented. Students are not aware of what they are to do for activity/task.</td>
</tr>
<tr>
<td>(tied to instructional sequence)</td>
<td></td>
<td>3 – 4 pts.</td>
<td>0 – 2 pts.</td>
</tr>
<tr>
<td><strong>Activity(ies)</strong></td>
<td>Activity(ies) is relevant to topic and is well connected to goals and instructional sequence. Materials and resources are clearly listed.</td>
<td>Activity(ies) is relevant to topic. They may only partially reach goals but are connected to instructional sequence.</td>
<td>Activity(ies) is not used. Lesson relies on direct instruction only.</td>
</tr>
<tr>
<td><strong>5 pts.</strong></td>
<td></td>
<td>3 – 4 pts.</td>
<td>0 – 2 pts.</td>
</tr>
<tr>
<td><strong>Group Work</strong></td>
<td>Lesson is very conducive to group work. Group work is critical to lesson implementation.</td>
<td>Lesson is conducive to group work but instructional sequence only touches on the use of groups.</td>
<td>Lesson is not conducive to group work. Lesson relies on direct instruction only.</td>
</tr>
<tr>
<td><strong>5 pts.</strong></td>
<td></td>
<td>3 – 4 pts.</td>
<td>0 – 2 pts.</td>
</tr>
<tr>
<td><strong>Assessment</strong></td>
<td>Assessment goals are clearly stated and relevant.</td>
<td>Assessment goals are vague.</td>
<td>Assessment goals/ideas are missing.</td>
</tr>
<tr>
<td><strong>5 pts.</strong></td>
<td></td>
<td>3 – 4 pts.</td>
<td>0 – 2 pts.</td>
</tr>
</tbody>
</table>
Feedback and Allocation of Points for Lesson/Microteaching Plan
(Comments will follow each numbered item and a rubric will be used to score the assignment)

I. Lesson Goals

II. Identification of appropriate standards (TEKS) and STAAR assessment

III. Introduction to Lesson

IV. Aligning Activity/ies with Materials/Resources

V. Group work

VI. Assessment

VII. Other comments

TOTAL SCORE: __/30
### Allocation of Points for Activity/Lesson Evaluation

If you meet each goal completely, you will receive full points for that goal. Incomplete or skipped goals will receive partial or no points.

<table>
<thead>
<tr>
<th>Goal:</th>
<th>Points:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity (and content) clearly identified and explained (Identifies the core content).</td>
<td>10 points</td>
</tr>
<tr>
<td>Described what you would change or not change about the activity.</td>
<td>10 points</td>
</tr>
<tr>
<td>Reflected on the implication(s) of altering/changing (or not altering/changing) the activity for future learning or practice (Informed on learning and instruction).</td>
<td>10 points</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>/30 points</strong></td>
</tr>
</tbody>
</table>

**A: 28 – 30 points**  
Presentations and analysis of activity well presented with **depth** and detailed explanation. Impact on individual teaching and reflection about personal practices well presented and examples of changes or reasons for no change supported well.

**B: 25 – 27 points**  
Reflection about activity and how they could/will impact teaching and learning is weak (superficial/lacked depth) but could improve with **work**. Impact on current teaching lacked some depth and showed little analysis (but beyond the bare minimum). Implications for future practice limited or also weak.

**C: 22 – 24 points**  
Overall, the evaluation and reflection very weak. Little discussion of what you would change or not change. Identified what was chosen for assignment (or simply described the activity) but little or no discussion with any depth about impact on current or future practice. Work showed bare minimum of analysis.

**D: 19 – 21 points**  
Overall, presentation and analysis non-existent. No discussion of what you would change or not change. Identified what was chosen for assignment and did not even describe the activity in-depth. Little or no discussion with any depth about impact on current or future practice.

**Fail: 18 points or fewer**  
Failed to meet structure requirements (or turn in assignment). Very shallow presentation.