MSED 4310 (17193)
Teaching Mathematics in Intermediate and Middle Grades
Summer I (June 11 to July 5) 2012 – Syllabus

University of Texas at El Paso
College of Education, Department of Teacher Education

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Dr. Song An</th>
<th>E-mail</th>
<th><a href="mailto:saan@utep.edu">saan@utep.edu</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>949-701-7667 (cell)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>915-747-7616 (office)</td>
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<tr>
<td>Office</td>
<td>College of Education, EDUC 808</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class Time</td>
<td>Tuesday 5:00 p.m. – 8:00 p.m.</td>
<td>UTEP Education Building 405</td>
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<tr>
<td></td>
<td>Thursday 5:00 p.m. – 8:00 p.m.</td>
<td>UTEP Education Building 405</td>
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<tr>
<td></td>
<td>On-line discussions throughout the semester</td>
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This syllabus is subject to change as needed. Any changes to the syllabus will be announced in class.

Course Description

This course analyzes contemporary curricula; implementation of methods relevant for active, authentic learning, and culture relevant teaching of mathematics to middle grade learners. Course instruction and activities include opportunities to understand state and national standards related to teaching and learning mathematics. The course will investigate how children learn mathematics and what is meant by deep understanding of mathematics as well as how to teach mathematics so that learners see relationships and connections within and between mathematics ideas. The course will also discuss equity principle and develop conceptual understanding of middle grade mathematics contents.

Required Textbook


Recommended Resources

1. NCTM Illuminations: http://illuminations.nctm.org/
3. Early Algebra: www.ase.tufts.edu/education/earlyalgebra/default.asp
7. Texas Education Agency (TAKS Released Tests): http://www.tea.state.tx.us/
Course Objectives/Student Learning Outcomes

<table>
<thead>
<tr>
<th>Students enrolled in this section will have multiple academic goals to achieve:</th>
<th>Instructor will use following assessments to evaluate students’ learning outcomes</th>
</tr>
</thead>
</table>
| 1. Develop a positive belief in teaching and learning mathematics; understand the role of the teacher as a reflective practitioner. | a. Course graded assignments  
b. Chapter quizzes  
c. Group chapter presentations |
| 2. Design mathematics lessons aligned with the NCTM and TEKS with emphasis of mathematics processes and conceptual understanding | a. Course graded Assignments  
b. Chapter quizzes  
c. Formative exams  
d. Group mini lesson teaching |
| 3. Identify and use curricular materials and resources that support learner-centered teaching practices. | a. Course graded assignments  
b. Chapter quizzes  
c. Group mini lesson teaching |
| 4. Create differentiated lessons effective for the diverse mathematics classroom. | a. Chapter quizzes  
b. Formative exams  
c. Group mini lesson teaching |
| 5. Explore and develop skills in instructional methods (i.e., use of mathematics manipulatives) appropriate for the teaching and learning of elementary mathematics concepts. | a. Course graded assignments  
b. Chapter quizzes  
c. Formative exams  
d. Class discussion and presentation on specific math contents |
| 6. Create assessments appropriate for the middle school students | a. Course graded assignments  
b. Chapter quizzes  
c. Formative exams |

Attendance, Participation and Professionalism

Attendance of individuals in the class is required and unexcused absences will result in a grade reduction. University rules regarding absences will be followed for the required class meetings. 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.

Students are 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.

All teaching candidates are expected to demonstrate the ethical and professional values associated with Middle Level Education. It is critical teaching candidates adopt and exhibit a professional demeanor at each point in their teacher preparation. Evidence of professional dedication will be expected through all work during classes and practicum, seminar, internship, and clinical experiences. Credit for participation and professionalism will be part of the evaluation. **Wireless phone usage is strictly prohibited in class.**
Assignment Format and Late Assignments

All assignments must be submitted electronically unless specified. It is highly recommended you save all your work electronically and also a hardcopy for your records before turning it in. The following format is required for every assignment submitted. Deviating from the format may result in reduced points, returned paper, or rejection of the assignment completely. All assignments should be double spaced and typed with 12-point font; page numbers should be included if more than one pages. You must label your assignment as you save it containing your last name and the assignment name. Only assignments submitted complete and on time will be considered for full credit. Without evidence that you were unavailable (sick) for the entire range of days, the assignment will be given a zero. Any assignments turned more than one week late (or the range of dates for submission) will receive zero points.

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.

Students with Special Needs

The American with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protections for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides a reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please notify your instructor and contact Disabled Student Services (DSSO) at 747-5148 or at dss@utep.edu or come by Room 106 Union East Building.
Course Requirement

Attendance & Class Participation
Your active participation in each class session is vital to your learning as well as to the learning of other students in the class. I expect you to attend all class meetings prepared for active, collaborative, participation during the session, whether it is whole group discussion, small group activity, or individual reflection. Preparation for class involves completion of assigned readings and tasks. If you are unable to attend a particular class session, please let me know beforehand. You are responsible for contacting someone in the class to find out what transpired in your absence. Late work will not be accepted. Make-up quizzes or tests may be scheduled only in the event of documented illness or emergency.

Group Chapter Presentation and Mini Lesson Teaching
Each group of three will select one chapter to make an interactive presentation the key contents on a date specified in class. The purpose of the discussion will be to synthesize the information in the chapter and explain the significance of the content. Your role is to be "peer leaders", that is while other students work in small groups, you will be providing content activities, and will help to maintain and encourage student interest and focus on conceptual understanding through a Socratic questioning dialog. You should also promote interaction within and among groups participated in content activities.

After the chapter presentation, each group of three will teach a mini-lesson based on the lesson plan that you designed. In the mini-lesson, you will address a specific mathematical concepts and procedures; you will treat your classmates as middle grade students and teach a mathematics lessons through interactive activities. You will distribute copies of your worksheets and other related handouts to all of your classmates, and you will submit an electronic copy of your final lesson (including any PowerPoint slides and handouts) to me via e-mail. Mini-lesson should be less than 45 minutes in length. If you have any need for manipulatives or other teaching material, please inform me one day before your lesson.

Pre Exam, Formative Exams and Summative Exam
The pre exam will be 7 points, the two formative exams will be 7 points each, and the summative exam will be 20 points. The exams will cover teacher certification tests contents, class discussions, assignments, activities, and readings. All the four examinations will be completed during class time as scheduled in the syllabus.

Online Quiz
Online quizzes can be found in Blackboard after each lesson. The quizzes will cover the important content in the readings and the lectures. Each quiz will have 10 multiple choice questions.

Discussion of Chapter
Participate in discussion 2-3 times each week on online discussions. Your posts should be meaningful, well thought-out, and articulate. Post your first response by the due days and post your follow up responses in the following two days. Read all the postings of your peers, and interact with your peers in a positive manner. You will reply at least three of your classmates’ posts in a meaningful way.
Assignment 1 & 2: Self Introduction & Education Philosophy

In assignment 1, you will write a short essay to introduce yourself. Share a story of one of your favorite mathematics teacher in your life and/or a story of your straggling experience in learning mathematics through K-12. Attach one of your recent photos at the end of your essay.

In assignment 2, your will write a short essay about your teaching philosophy. In the essay, you will include the following six areas: (1) the purpose of education and schools, (2) the role and responsibility of the student, (3) the role and responsibility of the teacher, (4) what is mathematics, (5) effective learning strategies, and (6) effective teaching strategies.

Assignment 3 & 4: NCTM Review & TEKS Review

Texas Essential Knowledge & Skills (TEKS) and National Council of Teachers of Mathematics Standards (NCTM) Standards are the two important mathematics standards that all teachers are required to know. You will read both documents and write a one page (single space) review of the documents. In the assignment 3, you will summarize the major thrust of each standard from grade 4-8 in NCTM and discuss a specific standard in the current reform milieu of teaching and learning mathematics. In the assignment 4, you will summarize the major thrust of each standard in TEKS from grade 4-8, you will also identify and discuss at least one of the key differences between the TEKS and the NCTM standards on a specific content area.

Assignment 5: Lesson Plan Development

Working in groups of three, you will prepare and teach a lesson based on the lesson plan you designed to your classmates. You will select a specific topic area for your lesson, which should link with the chapter you will present. Your goal is for the lesson to develop concepts from the topic, specifically the content standards and the five process standards. This lesson plan needs to fit the lesson plan evaluation criteria we develop in class (that will be posted on the course webpage).

Assignment 6 & 7: Curriculum Analysis & Instruction Analysis

In the assignment 6, you will examine and evaluate a mathematics curriculum (a unit of a series of lessons) from a middles school textbook. You will summarize the main structure of the curriculum and describe the main kinds of activities in which students will be involved. You will also discuss the strengths and possible weaknesses of the curriculum and explain how you may revise the curriculum. In the assignment 7, you will examine and evaluate mathematics instruction (a video clip if a lesson). You will identify the main teaching strategies the teacher used and describe the main kinds of activities in which students were involved. You will discuss the role of teachers and how teacher ask questions to help students identify the knowledge and/or assess students understanding. You will also discuss the strengths and possible weaknesses of the instruction; explain how you may revise the teaching process.

Assignment 8: Lesson Plan and Teaching Reflection

After you teach this lesson, you will write up a reflection essay of your lesson that includes the (a) description of the effectiveness of the lesson in developing understanding of the mathematical content as a teacher, (b) discuss the things you might do differently the next time you teach the lesson to promote understanding of the mathematics content, and discuss what you learned from the lesson preparing and teaching process.
Assignments and Grades

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Quiz × 7</td>
<td>5 Pts</td>
<td>Throughout Semester</td>
</tr>
<tr>
<td>Discussion of Chapter × 12</td>
<td>3 Pts</td>
<td>Throughout Semester</td>
</tr>
<tr>
<td>Assignment 1: Self Introduction Essay</td>
<td>5 Pts</td>
<td>(Week 1)</td>
</tr>
<tr>
<td>Assignment 2: Education Philosophy Essay</td>
<td>5 Pts</td>
<td>(Week 1)</td>
</tr>
<tr>
<td>Assignment 3: NCTM Review</td>
<td>5 Pts</td>
<td>(Week 2)</td>
</tr>
<tr>
<td>Assignment 4: TEKS Review</td>
<td>5 Pts</td>
<td>(Week 2)</td>
</tr>
<tr>
<td>Assignment 5: Lesson Plan Development</td>
<td>15 Pts</td>
<td>(Week 3)</td>
</tr>
<tr>
<td>Assignment 6: Curriculum Analysis</td>
<td>7 Pts</td>
<td>(Week 3)</td>
</tr>
<tr>
<td>Assignment 7: Instruction Analysis</td>
<td>7 Pts</td>
<td>(Week 4)</td>
</tr>
<tr>
<td>Assignment 8: Lesson Reflection</td>
<td>15 Pts</td>
<td>(Week 4)</td>
</tr>
<tr>
<td>Group Chapter Presentation</td>
<td>30 Pts</td>
<td>(Week 2 &amp; 3)</td>
</tr>
<tr>
<td>Mini Lesson Teaching</td>
<td>30 Pts</td>
<td>(Week 3 &amp; 4)</td>
</tr>
<tr>
<td>Pre Exam</td>
<td>7 Pts</td>
<td>(Week 1)</td>
</tr>
<tr>
<td>Formative Exam I</td>
<td>7 Pts</td>
<td>(Week 2)</td>
</tr>
<tr>
<td>Formative Exam II</td>
<td>7 Pts</td>
<td>(Week 3)</td>
</tr>
<tr>
<td>Summative Exam</td>
<td>20 Pts</td>
<td>(Week 4)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>236 Pts</strong></td>
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Grade Distribution:

- **A** 90% - 100% of point total
- **B** 80% - 89.9% of point total
- **C** 70% - 79.9% of point total
- **D** 60% - 69.9% of point total

Rubric for Assignments

<table>
<thead>
<tr>
<th>Level</th>
<th>Standard to be achieved for performance at a specified level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>Student fully achieves the goals and objectives of the assignment, has made accurate observations, drawn insightful conclusions and/or extensions, and shows clear understanding of concepts. Communicates effectively.</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Student substantially achieves goals and objectives of the assignment, displays clear understanding of concepts, although some less important ideas may not be in place. Communicate successfully</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>Student addresses all aspects of assignment, but goals and objectives may not be fully met. Student displays understanding of concepts, although elaboration may be needed and some less important ideas may not be in place. Student gives limited communication of some important ideas. Results may be incomplete or not clearly presented</td>
</tr>
<tr>
<td><strong>D</strong></td>
<td>Important goals or objectives of the assignment are not met. Work may need redirection. Gaps in conceptual understanding are present. Student’s approach to assignment may lead away from assignment completion. Assumptions and/or conclusions are incomplete, or flawed. Attempts communication.</td>
</tr>
<tr>
<td><strong>F</strong></td>
<td>Goals and objectives of the assignment are not met. Shows little or no evidence of appropriate reasoning. Presents fragmented understanding of concepts. Presents erroneous or extraneous conclusions.</td>
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</table>
### Rubric for Lesson Plan Development and Mini Lesson Teaching

<table>
<thead>
<tr>
<th>ELEMENTS</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner Outcomes/ Objectives</td>
<td>Not student-centered; Inappropriate outcomes; Not aligned with TEKS</td>
<td>Student-centered; Standards related; Sufficient for age group and concepts; Loosely tied to TEKS</td>
<td>Student-centered; Related to state and content standards; Appropriate to concepts and age group; Aligned with TEKS</td>
</tr>
<tr>
<td>TEKS/ Standards</td>
<td>Inappropriate/incomplete TEKS; No NCTM standards given</td>
<td>Appropriate TEKS/NCTM given included</td>
<td>All relevant TEKS/NCTM included</td>
</tr>
<tr>
<td>Materials and Resources</td>
<td>None listed; NCTM lesson not included</td>
<td>Necessary materials /resources given ; Includes NCTM lesson</td>
<td>Relevant to TEKS and student outcomes; Importance of topic given</td>
</tr>
<tr>
<td>Rationale</td>
<td>None listed or irrelevant</td>
<td>Somewhat relevant</td>
<td>Excellent and complete background information /preparation given</td>
</tr>
<tr>
<td>Background/ Preparation</td>
<td>Little/no preparation or background information given</td>
<td>Adequate information/ preparation given or described</td>
<td>Excellent beginning; Immediately “hooks” students; Relevant to topic and sets the stage for the lesson</td>
</tr>
<tr>
<td>Focus</td>
<td>None or inappropriate, irrelevant</td>
<td>Good introduction to topic but could be more relevant; Interests students</td>
<td>Excellent beginning; Immediately “hooks” students; Relevant to topic and sets the stage for the lesson</td>
</tr>
<tr>
<td>Explanation/ Engagement</td>
<td>No clear explanation or incorrect explanation; Inappropriate activities for objective; Time issues Few or no sample problems given</td>
<td>Needs more detailed explanation or may be incorrect on some points; Good student-centered activities; Good time allotment; Some variety of activities Some sample problems given</td>
<td>Clear, detailed correct explanation; Excellent student-centered activities leading to topic understanding and meeting outcomes; Excellent variety of strategies appropriate for objective; Excellent use of time; Excellent sample problems given</td>
</tr>
<tr>
<td>Questions</td>
<td>Inappropriate or few of the necessary questions</td>
<td>Good key questions reflect outcomes; May be missing some questions</td>
<td>Excellent, well-stated key questions reflecting the outcomes</td>
</tr>
<tr>
<td>Modification</td>
<td>Inadequate/inappropriate modifications</td>
<td>Adequate modifications; all groups not addressed</td>
<td>Excellent, appropriate modifications for all groups</td>
</tr>
<tr>
<td>Closure</td>
<td>No/inadequate closure</td>
<td>Good summary</td>
<td>Excellent summary with student participation</td>
</tr>
<tr>
<td>Assessment</td>
<td>None/inappropriate non-authentic assessment strategies; no or inappropriate rubric or checklist</td>
<td>TEKS; needs to be more performance based; rubric or checklist not complete</td>
<td>Excellent authentic assessment strategies in alignment with instruction, TEKS; well-defined rubric or checklist included</td>
</tr>
<tr>
<td>Follow-Up/Extension</td>
<td>None/inappropriate follow-up</td>
<td>Good follow-up that extends, reinforces lesson; All groups not addressed</td>
<td>Excellent, purposeful follow-up that extends, reinforces lesson; All groups addressed</td>
</tr>
<tr>
<td>Format and Neatness</td>
<td>Incorrect format/significant errors/typos</td>
<td>Adequate format; a few typos or errors</td>
<td>Neatly done; all required elements present</td>
</tr>
</tbody>
</table>
# General Calendar

*Changes may be made in this syllabus when judged appropriate by the instructor*

<table>
<thead>
<tr>
<th>Date</th>
<th>Class Topics/Activities</th>
<th>Assignments and Due dates</th>
</tr>
</thead>
</table>
| Week 1     | **Introduction/Syllabus/Pre-Exam**  
Chapter 1-3  
Foundation and Perspectives of Teaching Mathematics Part I | Discussions of Chapter 1-3. *Due June 15*  
Online Quiz 1  
Complete Assignment 1 (Self Introduction). *Due June 13* |
| Week 1     | Chapter 4-7  
Foundation and Perspectives of Teaching Mathematics Part II | Discussions of Chapter 4-6. *Due June 16*  
Discussions of Chapter 7-8. *Due June 17*  
Online Quiz 2  
Assignment 2 (Personal Philosophy) *Due June 18* |
| Week 2     | **Formative Exam I**  
Chapter 11 & 12  
Whole Number Computation  
Chapter 15 & 16  
Fraction Concepts and Computation  
Chapter 13 & 14  
Decimal Concepts and Computation | Discussions of Chapter 13 &14. *Due June 20*  
Discussions of Chapter 16 &17. *Due June 21*  
Discussions of Chapter 15 & 18. *Due June 22*  
Online Quiz 3  
Assignment 3 (NCTM Review). *Due June 24* |
| Week 2     | Chapter 18 & 23  
Proportional Reasoning and Real Numbers  
Chapter 19 & 20  
Measurement and Geometric Concepts  
Chapter 21 & 22  
Data Analysis and Probability | Discussions of Chapter 19 & 24. *Due June 23*  
Discussions of Chapter 20 & 21. *Due June 24*  
Discussions of Chapter 22 & 23. *Due June 25*  
Online Quiz 4  
Assignment 4 (TEKS Review). *Due June 25* |
| Week 3     | **Formative Exam II**  
Mini-lesson teaching through interactive hands-on activities  
Number and Operation | Discussion of Problem Solving. *Due June 28*  
Online Quiz 5  
Assignment 5 (Lesson Plan Design). *Due June 30* |
| Week 3     | Mini-lesson teaching through interactive hands-on activities:  
Geometry and Measurement | Discussion of Representation, Reasoning and Proof. *Due June 30*  
Online Quiz 6  
Assignment 6 (Curriculum Analysis). *Due July 2* |
| Week 4     | Mini-lesson teaching through interactive hands-on activities:  
Algebra, Data Analysis & Probability | Discussion of Communication and Connection. *Due July 4*  
Online Quiz 7  
Assignment 7 (Instruction Analysis). *Due July 5* |
| Week 4     | Course Review and Reflection  
**Summative Exam** | Assignment 8 (Lesson Plan and Teaching Reflection). *Due July 7* |