

**University of Texas at El Paso  
College of Education**

**Spring 2017  
MTED5322/ECED 5354**

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**Welcome to the class.**

**Course Description**

Course: MTED 5322

Topic: Pedagogical Content Knowledge in Teaching Mathematics (*Strengthening Mathematical Pedagogy in Quantitative reasoning*), Hybrid.

crosslisted with ECED 5354, *Development of Mathematics and Science Concepts in Young Children*

Credits: 3-0

**Education Bldg., Room 402, Tuesdays, 5:30 pm – 8:20 pm**

**Instructor Office Hours:** Tuesdays, 4:30 pm - 5:30 pm, 8:20 pm – 9:30 pm, Educ. 402 or by appointment.

**Instructor Contact Information**

This course is taught by Dr. Olga Kosheleva. She may be contacted within the Blackboard course system or by email at [olgak@utep.edu](mailto:olgak@utep.edu), or by phone at 915-747-7588.

Dr. Kosheleva's UTEP website is

<http://faculty.utep.edu/Default.aspx?alias=faculty.utep.edu/olgak>

**Information about HB 2504 Requirements**

*Texas House Bill 2504 requires each institution of higher education's faculty to provide the following syllabus related items, at a minimum:*

- 1. A brief description of each major course requirement, including each major assignment and examination*

2. *the learning objectives for the course*
3. *a general description of the subject matter of each lecture or discussion*
4. *and, list of any required or recommended readings.*

### ***Recommended materials/resources***

- Complementary website for a great book used in Math Methods classes: Van de Walle, John A. *Elementary and Middle School Mathematics: Teaching Developmentally*. 6th Edition. Longman. It provides "Blackline Masters" (manipulatives that can be used in your teaching), links to other useful websites and activities.

This website should be the main source for your Internet resources for mathematical activities.

[http://wps.ablongman.com/ab\\_vandewalle\\_math\\_6](http://wps.ablongman.com/ab_vandewalle_math_6)

- These websites provide a wide selection of virtual manipulatives for teaching mathematics (sometimes available in both, English and Spanish):

<http://nlvm.usu.edu/en/nav/vlibrary.html>

<http://www.shodor.org/interactivate/activities/>

<http://www.internet4classrooms.com/index.htm>

- Book "How Students Learn: History, Mathematics and Science in the Classroom" (2005). You can read it online (this site also allows you free download of this e-book) at [http://www.nap.edu/catalog.php?record\\_id=10126](http://www.nap.edu/catalog.php?record_id=10126)

- Book "Mathematics Learning in Early Childhood: Paths Toward Excellence and Equity." You can read it online (this site also allows you free download of this e-book) at [http://www.nap.edu/catalog.php?record\\_id=12519](http://www.nap.edu/catalog.php?record_id=12519)

- Book "Adding It Up: Helping Children Learn Mathematics". You can read it online (this site also allows you free download of this e-book) at

<http://books.nap.edu/books/0309069955/html/>

- Texas Essential Knowledge and Skills (TEKS)

<http://ritter.tea.state.tx.us/rules/tac/chapter111/ch111a.html>

- National Council for Teachers of Mathematics (NCTM) standards

<http://www.nctm.org/>

<http://standardstrial.nctm.org/triallogin.asp>

<http://www.fayar.net/east/teacher.web/math/Standards/>

<http://www.fayar.net/east/teacher.web/math/Standards/document/chapter3/rep.htm>

- NCTM curriculum focal points

<http://www.nctm.org/focalpoints/>

- Texas State University System Mathematics for English Language Learners Project

<http://www.tsusmell.org/>

### ***Course Learning Outcomes/Goals***

The course's learning outcomes will require a student to acquire throughout the semester new knowledge and skills and build upon them. The following table provides a list of the most relevant student learning outcomes for the course. The following outcomes are aligned with SBEC-approved Texas educator standards.

**Table 1. Student learning outcomes and assessment**

<b>Student Learning Outcomes</b>		<b>Assessments</b>
	<i>By the end of course, the successful student will be able to:</i>	<i>To evaluate these outcomes, the faculty member will use the following assessment procedures:</i>
1.	Deepen understanding of numbers, multiple ways of representing numbers, relationships among numbers, and number systems.	Class discussions and presentations.
2.	To deepen understanding of meanings of operations and procedures, and how they relate to one another.	Class discussions and presentations.
3.	To understand connection between measurement and geometry concepts and multiple ways of representing numbers, relationships among numbers, and number systems.	Class discussions and presentations.
4.	To understand the cognitive processes that result in effective learning and teaching of mathematical content.	Class discussions and presentations.
5.	To create successful learning environments in mathematical classroom.	Class discussions and presentations.

6.	Develop an understanding of current issues, practices and directions in mathematics curriculum and the ability to inquire into these.	Class discussions and presentations.
7.	Improve his/her capacity to think reflectively and creatively about their teaching of mathematics.	Class discussions and presentations.
5.	Increase confidence to teach mathematics.	Class discussions and presentations.
6.	Improve their ability to manage and assess their pupils' mathematics learning. Discover innovative methods of instruction to increase effectiveness and pupils' engagement, learning, and thinking.	Class discussions and presentations.
8.	Increase their capacity to become an agent of change in the field of mathematics education.	Class discussions and presentations.
9.	Develop knowledge and strategies to design curriculum at classroom and school levels.	Class discussions and presentations.

### ***Academic Integrity***

It is expected that work you submit will represent your own effort (or your own group's effort, if it is a group project), will not involve copying from or accessing unauthorized resources or people (e.g., from a previous year's class), and will appropriately acknowledge allowable references that you do consult. If, in future, in your articles and grant submissions you will be using ideas developed and presented by other students in this class, you are required to appropriately acknowledge their contributions. Violations are unacceptable and will be referred to the Dean of Students Office for possible disciplinary action. Don't resubmit work completed for other classes without specific acknowledgment and permission from me.

If you are found to be cheating or plagiarizing, you will be subject to disciplinary action, per UTEP catalog policy. Refer to <http://www.utep.edu/dos/> for further information. In addition, you may also see the Regent Rules and Regulations at <http://www.utsystem.edu/bor/rules/>

The following is a website provides a brief overview of how to accurately cite sources: <http://www.bedfordstmartins.com/online/citex.html>

### ***Course requirements, assignments, examination***

#### **Course Policy/Requirements**

To be successful in this course, class functionality, assignments and activities rely heavily on your early understanding of expectations. You are also responsible for doing all the work and going over your readings and completing assignments the. These courses take as much, if not more time than traditional classes.

Please check course announcements/emails every day to keep yourself abreast of any changes in course content and deadlines.

1. It is required that you have a UTEP e-mail. You must use your UTEP email account for all correspondence related to this course and check it regularly to ensure that you receive important messages about the course on a timely basis. If you are enrolled in this course, you already have an email account created for you. If you do not remember your UTEP email address and password, please call 915-747-5257 or go to "<https://newaccount.utep.edu/>";
2. Mandatory file formats: all text attachments you upload to assignments, discussion postings, or email messages must be MS Word documents (.doc, .docx or .rtf); all images should be in JPEG Format (.jpg); if you send your work in a file, its name should always include week submission number and your name (last and first name).
3. The general format used by papers in this course is APA version 6.
4. **It is responsibility of any student desiring to drop the course to turn in all the necessary drop forms. The instructor will not drop students who are no longer attending the class.**
5. **The instructor reserves the right to drop students who have not adequately participated during two weeks of class (face-to-face or ONLINE). The instructor can drop any student any time a student violates the written rules/requirements for remaining in good standing in the course.**

#### **Students will be required to:**

- Actively participate in class assignments, pre and post-tests, quizzes and presentations.
- Read assigned pages in the chapters and materials provided on BlackBoard and/or distributed in class.
- Complete and Submit individual reflections, lesson plans and Final Reflection paper (in required formats).

#### **Deadline and Assignments Policy**

- All on-line assignments (to be submitted via BlackBoard) are due by 11:59 PM (Mountain Time) on the assigned day.
- For all the students the grades will be provided once during four weeks period (as average grade for that period of time). Your grades with explanations will be posted/mailed via Blackboard.
- Please ensure that you carefully read all instructions for each assignment, particularly the due dates and times. Reading instructions is your responsibility and you should not assume due dates or times.
- Keep electronic copies of all work submitted. In case your file submission is too big, please break it into several smaller files, and then submit these smaller files in several submissions.
- Professional courtesy and a positive, collaborative attitude are required in all aspects of this course. I invite open, honest communication. However, all communication must be on a professional level, not personal.

- You are expected to produce quality work in this course. Spelling, grammatical errors, structure and presentation will influence your final grade and each grade on any project.
- Please, DON'T WAIT UNTIL THE LAST MINUTE to complete and submit your assignments! There might be some technical glitches in the system: try to avoid them. The best way to avoid them is to start your assignments as soon as they are posted.
- You are welcome to use any resources to successfully complete your assignments. Outside resources should be quoted and a proper reference to the resource should be made.
- E-mail messages could be also sent to your UTEP email address, so you will want to check your UTEP e-mail every day.

### What should you expect from me as the instructor?

- I will provide you clear instructions on class expectations.
- I will check my UTEP and BlackBoard e-mail every day during first week of classes and will answer back to you as soon as possible. During the rest of the semester I will check my e-mail at least twice a week (during two non-consecutive days a week).
- If it is possible and within reason, I will return phone calls related to class activities in a timely manner.
- I will provide graded feedback on your performance (typically you will receive your average grades via Blackboard email once every four weeks).
- I will leave myself open to suggestions about improvement of the class and class related activities.
- I will do all I can to ensure your learning and success in this class.
- If any changes in the course are to be implemented, I will ensure that the class is notified in a timely manner.

### Tentative Course Schedule/Calendar and Description of the Assignments

<b>Dates</b>	<b>Assignments</b>
<b>Week 1</b> <i>Jan 17</i>	Introduction. Pre-test. Presentation of Library Databases. Additional assignments (if available) can be found in <b>Discussion Forum “Week 1” (on Blackboard)</b> .
<b>Week 2</b> <i>Jan 22 (F2F)</i>	Pre-test/pre-survey. Discussion on Pedagogical Content Knowledge. Additional assignments (if available) can be found in <b>Discussion Forum “Week 2” (on Blackboard)</b> .
<b>Week 3</b> <i>Jan 29 (F2F)</i>	Quiz #1. Continue discussion on Pedagogical Content Knowledge and on the concepts of Set Theory. Discussion on the concepts of Set Theory as the language for defining counting the process of counting whole numbers. Search activities for relevant articles in Math Education journals. Students’ presentations. Additional assignments (if available) can be found in <b>Discussion Forum “Week 3” (on Blackboard)</b> .
<b>Week 4</b> <i>Feb 5 (ONLINE)</i>	Assignments can be found in <b>Discussion Forum “Week 4” (on Blackboard)</b> .
<b>Week 5</b> <i>Feb 12 (F2F)</i>	Quiz #2. During this week we will discuss arithmetic operations, and their essential properties. Search activities for relevant articles in Math Education journals. Students’ presentations.

	Assignments (if available) can be found in <b>Discussion Forum “Week 5” (on Blackboard)</b> .
<b>Week 6</b> <i>Feb 19 (F2F)</i>	Quiz #3. Search activities for relevant articles in Math Education journals. Students’ presentations. Assignments (if available) can be found in <b>Discussion Forum “Week 6” (on Blackboard)</b> .
<b>Week 7</b> <i>Feb 26 (F2F)</i>	Quiz #4. Search activities for relevant articles in Math Education journals. Students’ presentations. Assignments (if available) can be found in <b>Discussion Forum “Week 7” (on Blackboard)</b> .
<b>Week 8</b> <i>March 5 (F2F)</i>	Quiz #5. Search activities for relevant articles in Math Education journals. Students’ presentations. Assignments (if available) can be found in <b>Discussion Forum “Week 8” (on Blackboard)</b> .
<b>Week 9</b> <i>March 19 (F2F)</i>	Quiz #6. Search activities for relevant articles in Math Education journals. Students’ presentations. Assignments (if available) can be found in <b>Discussion Forum “Week 9” (on Blackboard)</b> .
<b>Week 10</b> <i>March 26 (F2F)</i>	Quiz #7. Search activities for relevant articles in Math Education journals. Students’ presentations. Assignments (if available) can be found in <b>Discussion Forum “Week 10” (on Blackboard)</b> .
<b>Week 11</b> <i>April 2 (ONLINE)</i>	During this week we will continue discussion on measurements. Search activities for relevant articles in Math Education journals. Students’ presentations. Assignments (if available) can be found in <b>Discussion Forum “Week 11” (on Blackboard)</b> .
<b>Week 12</b> <i>April 9(F2F)</i>	Quiz #8. Search activities for relevant articles in Math Education journals. Students’ presentations. Assignments (if available) can be found in <b>Discussion Forum “Week 12” (on Blackboard)</b> .
<b>Week 13</b> <i>April 16 (F2F)</i>	Quiz #9. During this week we will continue discussion on measurements. Search activities for relevant articles in Math Education journals. Students’ presentations. Additional assignments can be found in <b>Discussion Forum “Week 13” (on Blackboard)</b> .
<b>Week 14</b> <i>April 23 (F2F)</i>	Quiz #10. Search activities for relevant articles in Math Education journals. Students’ presentations. Additional assignments can be found in <b>Discussion Forum “Week 14” (on Blackboard)</b> .
<b>Week 15</b> <i>April 30 (ONLINE)</i>	Assignments can be found in <b>Discussion Forum “Week 15” (on Blackboard)</b> .
<b>Final week</b> <i>May 7 (F2F)</i>	Post-test. Submit your final reflection paper, 3 pages (via Blackboard email, subject “Final Reflection Paper.”) This paper should summarize the concepts about quantitative reasoning we discussed in this class. Deadline is May 12, 11 pm, MT.

## Course Grading

### Grade Distribution

Assignment	Possible number of points
Pre/Post Test	<b>2x25 points = 50 points</b>
Presentations, Final Lesson Plan, Final Reflection Paper	<b>20 points</b>
Quizzes	<b>10X3 points = 30 points</b>
Total	<b>100 points</b>

## Grading Scale

90 - 100 = A (Excellent - 4.0)

80 - 89 = B (Good - 3.0)

70 - 79 = C (Average - 2.0)

60 - 69 = D (Passing - 1.0)

0 - 59 = F (Failure - 0.0)

You are encouraged to demonstrate *knowledge of content/ issues discussed in the class, critical thinking, and communication accuracy* while completing major course assignments.

The course instructor reserves the right to adjust the course syllabus or change assignments as needed. Remember that our course syllabus and class schedule are living documents and can change!

## Students with Disabilities

If you have or believe you have a disability, you may wish to identify yourself. You can do this by contacting the Center for Accommodations and Support Services Office to show documentation of a disability or to register for testing and services. Students who have been designated as disabled must reactivate their standing with this office yearly. Please, visit the following website for more details: <http://sa.utep.edu/cass/>

## Copyright Notice

**Many of the materials that are posted within this course are protected by copyright law. These materials are only for the use of students enrolled in this course and only for the purpose of this course. They may not be further retained or disseminated.**

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## Rubrics

### Rubric for Lesson Plan

Items present in the Lesson Plan	Item and explanation are absent from LP Points = 0	Everything related to this item is partially explained, and articulated (1-3 points)	Everything related to this item is well explained, and articulated (4-5 points)	Total Points earned
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<u>Title, time, grade level</u>				
<u>National and State Standards</u>				
<u>Connection to textbook ideas (connection is explained, page numbers are provided)</u>				
<u>Materials/resources/references used (in your Final Project, please, provide extensive references for your lesson)</u>				
<u>Lesson Introduction/Opening Activities</u>				
<u>Explanation of the type of mathematical knowledge that will be taught in this lesson (procedural or conceptual or both)</u>				
<u>Detailed description of mathematical activities</u>				
<u>Description of questions you might anticipate from different students (beginning learner, intermediate learner, advanced learner); description of your answers</u>				
<u>Will you be using any manipulatives? Why yes or why no? How will you be using them?</u>				
<u>Closing the lesson: will you be doing assessment (to find out if students acquired mathematical knowledge you were teaching)? will you summarize and provide conclusions and future directions?</u>				

### Grading Rubric for Short Reflection

<b>Category</b>	<b>Exceeds Standards</b>	<b>Meets Standards</b>	<b>Does not Meet Standards</b>
<i>Short Reflection</i>	The piece is thoughtful, engaging, and clearly	Shows adequate reflection along with	Does not adequately address the question or prompt, and

	written. The piece shows careful consideration of the topic at hand. It responds directly to the question or prompts and makes meaningful connections with the readings and course content. The piece has been proofread.	some level of thoughtfulness, and may or may not have responded directly to the question or prompt. It also contain grammatical or sentence structure errors that disrupt the flow of the narrative.	shows limited thoughtfulness.
Points	(5)	(4-3)	(2-1)

### Grading Rubric for Online Discussion

Points	5	3-4	1-2
<b>Analysis / Interpretation</b>	The message uses sources, including outside as well as required reading. In addition, it demonstrates that the student has gained new understanding of the topic.	Some messages do analysis or interpretation well, but a significant number do not. This might be because the analysis was not done well or because it was not attempted (that is, was simply opinion).	Messages generally show little evidence of analysis, consisting instead of opinion and feelings and impressions.
<b>Writing Skill</b>	Sentences are clear and wording is unambiguous. Correct word choice, correct spelling, and correct grammar. Writing style can still be conversational rather than formal. The writing does not have to be flawless, but it will be better than average writing.	Ordinary, good writing. Lapses are regular and patterned, but do not undermine the communication or the persuasiveness of the argument.	Grammar, spelling, and/or word choice errors are frequent enough that the sense of the message is lost or muddled.
<b>Participation</b>	Messages contribute to ongoing conversations, as replies to questions or comments, or as new questions or comments. Messages that originate a thread usually generate responses. Student does not start a	Some messages contribute to ongoing conversations, but others are disconnected. If the student starts a new thread, sometimes there is follow-up but sometimes there isn't. Student tries to further the class discussion but is not successful a	Messages are unconnected with what others are saying, as if there is no conversation. No replies to other messages. Student never answers someone else's question. When student asks a question, there's no

	topic or pose a question and then abandon it.	significant number of times. Or, student posts a significant (though still a minority) number of messages that are off-the-cuff and do not contribute substantively.	acknowledgment to any responses.
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### Participation Rubric

Throughout the semester students are expected to:

- Participate fully in class activities and assignments. Understand your roles and responsibilities in acquiring Student Learning Outcomes for this class.
- Make insightful comments, informed by required reading and your own critical thinking. Demonstrate reflections on your readings. Communicate questions, comments and thoughts on readings.
- Treat class activities, group discussions as important components of the course, showing respect for fellow classmates and the course material.

Participation points will be assigned based on the extent to which students meet the above criteria.

Description of performance	Points earned
Student <b>exceptionally and consistently</b> demonstrates the criterion throughout the semester	4
Student <b>proficiently and frequently</b> demonstrates the criterion throughout the semester	3
Student <b>satisfactory and intermittently</b> demonstrates the criterion throughout the semester	2
Student <b>inadequately and sporadically</b> demonstrates the criterion throughout the semester	1
Student <b>does not</b> demonstrates the criterion throughout the semester	0

### Scholarly Paper Rubric

Criterion	Strong (11-9 pts)	Acceptable Pass(8-5 pts)	Not Acceptable (4-1 pts)
<b>Foundation of</b>	Response demonstrates a	Response demonstrates above	Response

<p><b>Knowledge</b></p>	<p>professional command of the subject matter.</p> <p>The scholarly conversation about the topic is analyzed and synthesized; response shows how ideas are related.</p>	<p>average command of subject matter.</p> <p>Analysis, synthesis, or relationships among ideas are explored.</p>	<p>explains some concepts, but overlooks critical details.</p> <p>Analysis, synthesis, or relationships among ideas are not provided.</p>
<p><b>Organization and development of Ideas and/or arguments</b></p>	<p>Major sections of response follow a logical sequence.</p> <p>Organization within sections is logical and consistent.</p> <p>If section headings are used, they are clear and logically placed.</p> <p>Fully responds to each component of the questions.</p>	<p>Major sections of response generally follow a logical sequence.</p> <p>Organization within sections is basically logical.</p> <p>Minimal responses to all components of the question.</p>	<p>The structure of the response is unclear or relies on simplistic narrative.</p> <p>Organization between paragraphs is difficult to determine.</p> <p>If section headings are used, they are vague and/or, illogical.</p> <p>Response does not address all the components of the question.</p>
<p><b>Writing Skills</b></p>	<p>Response demonstrates an excellent command of grammar, spelling, and mechanics and is free of distracting errors.</p> <p>Word use is appropriate and accurate.</p>	<p>Response demonstrates a good command of grammar, spelling, and mechanics and has only a few distracting errors.</p> <p>Word use is generally appropriate and accurate. May have a few misused words.</p>	<p>Response has consistent patterns of error in grammar, spelling, and mechanics that must be addressed.</p>

			There are frequent, noticeable errors or inappropriate uses of words.
<b>Citations</b>	In-text citations clearly and appropriately identify every author whose ideas are referred to, discussed, summarized, paraphrased, or quoted.	In-text citations identify most authors whose ideas are referred to, discussed, summarized, paraphrased, or quoted. One or two citations are vague or inaccurate.	In-text citations are generally inconsistent, unclear, misplaced, or missing.