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

MTED5322  
Fall 2020

Course Title: Pedagogical Content Knowledge in Teaching Mathematics  
Credits: 3-0  
Course Description: Course topics include (but are not limited to) the following main content domains of school mathematics and their effective teaching and learning: Development of Quantitative Reasoning; Fostering Algebraic Thinking; Conceptual Foundations of Calculus; Development of Geometric Thinking.

Course Instructor Contact Information  
Professor: Dr. Mourat A. Tchoshanov  
Office: EDUC612  
Phone: 915-747-7668  
Fax: 915-747-7441  
Section: Online with some synchronous sections as needed  
Office hours: R 4:00 - 5:00 PM  
E-mail: mouratt@utep.edu  
Website: http://mourat.utep.edu

Required Texts  

Additional Bibliography could be found in the bibliography sections of the required text.

Learning Outcomes  
On completion of this course, students should be able to:  
- To understand the role of teacher pedagogical content knowledge in learning and teaching of school mathematics  
- To reflect on the development of students’ conceptual understanding and procedural fluency in learning mathematics  
- To analyze classroom cases and situations with the purpose of improving teaching practices in the mathematics classroom  
- To learn classroom techniques to make connections between students’ ideas, between student and teacher ideas, between different mathematical ideas, domains, and representations.
<table>
<thead>
<tr>
<th>Week</th>
<th>Activities</th>
<th>Assignments/ Submissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Introduction and Syllabus Review/Zoom meeting</td>
<td>Introduction Card</td>
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<tr>
<td>Week 2</td>
<td>Video case #1</td>
<td>Reflection on Video Case-1*</td>
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<td>Week 3</td>
<td>Discussion on Video Case-1</td>
<td>Discussion Board Postings**</td>
</tr>
<tr>
<td>Week 4</td>
<td>Video case #2</td>
<td>Reflection on Video Case-2</td>
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<td>Week 5</td>
<td>Discussion on Video Case-2</td>
<td>Discussion Board Postings</td>
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<td>Week 6</td>
<td>Video case #3</td>
<td>Reflection on Video Case-3</td>
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<td>Week 7</td>
<td>Discussion on Video Case-3</td>
<td>Discussion Board Postings</td>
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<tr>
<td>Week 8</td>
<td>Video case #4</td>
<td>Reflection on Video Case-4</td>
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<tr>
<td>Week 9</td>
<td>Discussion on Video Case-4</td>
<td>Discussion Board Postings</td>
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<tr>
<td>Week 10</td>
<td>Video case #5</td>
<td>Reflection on Video Case-5</td>
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<tr>
<td>Week 11</td>
<td>Discussion on Video Case-5</td>
<td>Discussion Board Postings</td>
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<td>Week 12</td>
<td>Video case #6</td>
<td>Reflection on Video Case-6</td>
</tr>
<tr>
<td>Week 13</td>
<td>Discussion on Video Case-6</td>
<td>Discussion Board Postings</td>
</tr>
<tr>
<td>Week 14</td>
<td>Video case #7</td>
<td>Reflection on Video Case-7</td>
</tr>
<tr>
<td>Week 15</td>
<td>Discussion on Video Case-7</td>
<td>Discussion Board Postings</td>
</tr>
<tr>
<td>Week 16</td>
<td>Video case #8</td>
<td>Reflection on Video Case-8</td>
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</tbody>
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* Reflections are due every even week by Sunday at 11:59PM
** Required discussion board postings are due every odd week by Sunday at 11:59PM

**Main Course Assignments**

1. **Readings**: each student will read chapters from “Connecting mathematical ideas” related to each video case and use it as a reference for the reflections and discussions.

2. **Discussion Board Participation**: each student will submit 2 required (minimum 150 words each) postings in the Discussion board related to class activities (e.g., video cases, readings).

3. **Reflections on Video Cases** (APA style, 6-8 pages, double-spaced, 1-inch margins, font - Times New Roman, font size – 12, Word document): each student will write reflections addressing discussion questions on every video case. There will be eight video cases and correspondingly eight reflections during the class.

**Assessment of Learning Outcomes**

<table>
<thead>
<tr>
<th>Learning Outcome</th>
<th>Achieved by</th>
<th>Measured by</th>
</tr>
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<tbody>
<tr>
<td>To understand the role of teacher pedagogical content knowledge in learning and teaching of school mathematics</td>
<td>Reading and reflection Participation in discussions</td>
<td>Written Reflection Discussion Board Posting</td>
</tr>
</tbody>
</table>
To analyze and reflect upon teaching and learning practices in middle school mathematics classroom.  | Reflections on video cases Participation in discussions | Written Reflection Discussion Board Posting |
---|---|---|
To reflect on the development of students' conceptual understanding and procedural fluency in learning mathematics | Reading and reflection Participation in discussions | Written Reflection Discussion Board Posting |
To learn and evaluate classroom techniques that provide connections between students' ideas, between student and teacher ideas, between different mathematical ideas, domains, and representations. | Reflections on video cases Participation in discussions | Written Reflection Discussion Board Posting |

**Grade Distribution**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Participation/Discussions (each posting - 2 points)</td>
<td>32%</td>
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<tr>
<td>Reflections on Video Cases (each reflection - 8 points)</td>
<td>64%</td>
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<tr>
<td>Bonus points</td>
<td>4%</td>
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</table>

**Grading Scale**

Students are encouraged to demonstrate their *knowledge of content (be content specific), critical thinking, and communication accuracy* while completing course assignments.

\[
91 - 100 = A \quad 81 - 90 = B \quad 71 - 80 = C \quad 61 - 70 = D \quad 00 - 60 = F
\]

**General Grading Rubric**

Course assignments will be graded using the following main benchmarks:

- **Content Specificity**
  
  TRY TO AVOID THE USE OF GENERAL LANGUAGE – BE AS MATH-SPECIFIC AND DETAILED AS POSSIBLE!

- **Critical Thinking**
  
  DON'T JUST DESCRIBE WHAT YOU SEE AND READ - THINK CRITICALLY ABOUT WHAT YOU SEE AND READ!

- **Communication Accuracy**
  
  TRY TO AVOID VAGUE DESCRIPTIONS AND VOCABULARY - COMMUNICATE YOUR IDEAS CLEARLY AND ACCURATELY!

**Grading Rubric**

Reflections:

Based on these major benchmarks, the following rubrics will be used to grade your reflections:

- **Excellent Work (8 points + potential bonus point):** an exemplary content-specific response with a high level of critical thinking and communication accuracy.
**Good Work (5 points):** a response is partially content specific with a good level of critical thinking and accurate communication.

**Satisfactory Work (3 points):** low level of content specificity along with descriptive thinking and partially accurate communication.

**Poor Work (1 point):** a response is too general without specifics and details, communication is poor.

**No Work (0 point).**

**Discussion Board Postings:**
There will be eight Discussions during the semester. Most of them will focus on the challenging aspects of the major class assignments (e.g., readings, video-cases). Below is the rubric, which will be used to assess the quality of your responses.

<table>
<thead>
<tr>
<th>Quality of Posting</th>
<th>2.0 Points</th>
<th>1.5 Points</th>
<th>1.0 Point</th>
<th>0.5 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completeness</td>
<td>Responds completely to all questions.</td>
<td>Responds to most questions.</td>
<td>Responds to a few of the questions.</td>
<td>Responds to one question or less.</td>
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<tr>
<td>Clarity and Details</td>
<td>Main idea stands out and is supported by detailed and content-specific information.</td>
<td>The main idea is clear but the supporting information is too general.</td>
<td>The main idea is somewhat clear but there is a need for more supporting information.</td>
<td>The main idea is not clear. There is a seemingly random collection of information.</td>
</tr>
<tr>
<td>Accuracy</td>
<td>All supportive facts are reported accurately.</td>
<td>Almost all supportive facts are reported accurately.</td>
<td>Few supportive facts are reported accurately.</td>
<td>NO facts are reported OR most are inaccurately reported.</td>
</tr>
<tr>
<td>Resources</td>
<td>All resources used for quotes and facts are credible and cited correctly using APA format.</td>
<td>Most resources used for quotes and facts are credible and cited correctly using APA format.</td>
<td>Few resources used for quotes and facts are credible and cited not correctly.</td>
<td>Resources used for quotes and facts are less than credible (suspect) and cited not correctly.</td>
</tr>
<tr>
<td>Grammar</td>
<td>The writer makes no errors in grammar or spelling that distracts the reader from the content.</td>
<td>The writer makes 1-2 errors in grammar or spelling that distracts the reader from the content.</td>
<td>The writer makes 3-4 errors in grammar or spelling that distracts the reader from the content.</td>
<td>The writer makes more than 4 errors in grammar or spelling that distracts the reader from the content.</td>
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**Software Requirements**
1. Course materials supplementing the required text will be uploaded on UTEP Blackboard Ultra LMS.
2. Adobe® Reader® is free software that allows everyone from business professionals to home users to easily and reliably view, print, and search PDF files using a variety of platforms and devices.

3. Microsoft Office® - This product is available at the UTEP Bookstore.

4. E-mail tool with file attachment capability. Please use your UTEP e-mail account.

Course Schedule of Assignments
Please, look at the course schedule of assignments by clicking on the Syllabus link on the Blackboard homepage of the course.

Course Schedule Changes
As the course instructor, I reserve the right to adjust the course syllabus or change assignments as needed. I will be sure to give you plenty of notice prior to any changes. Remember that our course syllabus and class schedule are living documents and can be changed!

Class Participation
I strongly recommend that you check your Blackboard course at least three times a week at minimum to keep up.
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. LATE SUBMISSIONS ARE NOT ALLOWED!
Since the course is hybrid, it is your responsibility to schedule any emergencies around the course schedule. NOT THE OTHER WAY AROUND!
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. I encourage you to use my OFFICE HOURS to clarify any questions or concerns you may have.
E-mail messages are sent to your UTEP email address, so you will want to check your UTEP e-mail several times a week.
There will be NO INCOMPLETES offered in this course. Past experience has shown that if you cannot complete the course during the time allotted, you probably never will.

Professionalism
Along with basic standards of citizenship (e.g., “Student Conduct” and “Disruptive Acts Policy” in the UTEP Catalog), students in this course are required to display a positive attitude and professionalism. Be open to using or sharing opportunities for professional growth via Blackboard Discussion Board option. In terms of written assignments, professionalism includes that all assignments be Word processed, checked for spelling/grammar, and have an appropriate output/graphics electronically pasted into the document.

Academic Integrity
The instructor trusts that you understand and especially appreciate that cheating, plagiarism, and collusion in dishonest activities are serious acts, which erode the university's purpose and integrity. It is expected that work you submit will represent your own effort, will not involve copying from or accessing unauthorized resources or people (e.g., from a previous year's class), and will appropriately acknowledge (with complete citations) allowable references that you do consult. Also, don't resubmit work completed for other classes without specific acknowledgment and permission from the instructor. Violations are unacceptable and are required to be referred to the Dean of Students Office for possible disciplinary action.