

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

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| <u>Course Title</u> | Current Topics in Mathematics Education |
| <u>Topic</u> | Learning Theory in Mathematics Classroom |
| <u>Credits</u> | 3-0 |
| <u>Course Description</u> | Develop competencies necessary to deal effectively with mathematics instruction; includes curriculum, concepts, teaching strategies, and skills necessary to integrate content and teaching strategies. |
| <u>Course Schedule</u> | Summer-1 2017, Online |

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| Professor: <i>Dr. Mourat A. Tchoshanov</i> | Section: Online |
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Required Texts

- Boaler, J., & Humphreys, C. (2005). Connecting Mathematical Ideas: Middle school video cases to support teaching and learning. – Portsmouth, NH: Heinemann.
- National Research Council (2005). How students learn mathematics in the classroom. M. Suzanne Donovan & John D. Bransford, Eds. Washington, DC: The National Academies Press (available on-line at <http://books.nap.edu/catalog/10126.html> and BlackBoard)

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

Learning Outcomes

On completion of this course, students should be able to:

- To understand the guiding principles of learning and teaching of mathematics in the classroom
- To reflect on implementation of the guiding principles in the mathematics classroom with emphasis on students' conceptual understanding and procedural fluency
- To analyze classroom cases and situations with purpose of improving teaching practices in mathematics classroom
- To learn classroom techniques to make connections between students' ideas, between student and teacher ideas, between different mathematical ideas, domains, and representations.

TEXES Standards and Competencies

As a result of this course students will demonstrate knowledge and skill in TEXES Pedagogy and Professional Responsibility Standards and Competencies (with primary focus on Domains I - III) and Mathematics content test (Domains V-VI). For more information visit: <http://www.sbec.state.tx.us/>.

Course Schedule

| Day | Activities | Assignments/ Submissions |
|-------|--|--|
| 06/12 | Introduction and Syllabus Review | Introduction Card Error orientation survey Due: 6/15 at 11:59pm |
| 06/15 | Video case #1: Watch Video Case -1 | Reflection on Video Case-1 Due: 6/19 at 11:59pm |
| 06/19 | Video case #2: Watch Video Case -2 | Reflection on Video Case -2 Due: 6/22 at 11:59pm |
| 06/22 | Reading #1: Read “Mathematical Understanding” Video case #3: Watch Video Case -3 | Test on Reading #1 Reflection on Video Case -3 Due: 6/26 at 11:59pm |
| 06/26 | Reading #2: Read “Fostering Whole- Number Sense” Video case #4: Watch Video Case -4 | Test on Reading #2 Reflection on Video Case -4 Due: 6/29 at 11:59pm |
| 06/29 | Reading #3: Read “Pipes, Tubes, and Breakers...” Video case #5: Watch Video Case -5 | Test on Reading #3 Reflection on Video Case -5 Due: 7/03 at 11:59pm |
| 07/03 | Reading #4: Read “Teaching and Learning Functions” Video case #6: Watch Video Case -6 | Test on Reading #4 Reflection on Video Case -6 Due: 7/06 at 11:59pm |
| 07/06 | Video case #7: Watch Video Case -7 Video case #8: Watch Video Case -8 | Reflection on Video Case -7 & 8 Due: 7/10 at 11:59pm |

Course Assignments

1. **Participation/ Discussion:** each student is encouraged actively participate in the discussion related to class activities (e.g., video cases, readings).
2. **Reflections on Video Cases** (single spaced, 1 inch margins, font size – 12, Word): each student will write reflections addressing discussion questions on every video case (from B&H). There will be eight video cases and correspondingly eight reflections during the class.
3. **Readings:** each student will read assigned chapters from “How Students Learn” and take chapter tests on assigned readings. There will be four assigned readings during the class.

Assessment of Learning Outcomes

| Learning Outcome | Achieved by | Measured by |
|---|---|---|
| To understand the guiding principles of learning and teaching of mathematics in the classroom. | Reading and reflection Participation in discussions | Concept Test Participation Checklist |
| To analyze and reflect upon teaching and learning practices in middle school mathematics classroom. | Reflections on video cases Participation in discussions | Written Reflection Participation Checklist |
| To implement the guiding principles in the mathematics classroom in order to develop students' conceptual understanding and procedural fluency. | Problem solving activities Participation in discussions | Solution to Activity Participation Checklist |
| 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 Web activities Participation in discussions | Written Reflection Participation Checklist |

Grade Distribution

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| Participation/Discussions | 28% |
| Reflections on Video Cases | 32% |
| Readings/ Chapter Tests | 40% |

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 81 – 90 = B 71 – 80 = C 61 – 70 = D 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!

Based on these major benchmarks, the following rubrics will be used to grade your assignments:
4.0 = Excellent Work: an exemplary content-specific response with high level of critical thinking and communication accuracy.

3.0 = Good Work: a response is partially content specific with good level of critical thinking and accurate communication.

2.0 = Satisfactory Work: low level of content specificity along with descriptive thinking and partially accurate communication.

1.0 = Poor Work: a response is too general without specifics and details, communication is poor.

0.0 = No Work.

Use these rubrics to interpret your grades on all course assignments except discussion postings (see below), please.

Discussion Grading Rubric

There will be a number of Chapter Tests (which will have some open ended questions) and Discussions during the semester. Most of them will focus on the challenging aspects of the major class assignments (readings, video-cases, web reflections). Below is the rubric, which will be used to assess the quality of your responses.

| Quality of Posting | 1.0 Point | .75 Points | .50 Points | .25 Points |
|---------------------|--|---|---|--|
| Completeness | Responds completely to all questions. | Responds to most questions. | Responds to a few of the questions. | Responds to one question or less. |
| Clarity and Details | Main idea stands out and is supported by detailed and content-specific information. | The main idea is clear but the supporting information is too general. | The main idea is somewhat clear but there is a need for more supporting information. | The main idea is not clear. There is a seemingly random collection of information. |
| Accuracy | All supportive facts are reported accurately. | Almost all supportive facts are reported accurately. | Few supportive facts are reported accurately. | NO facts are reported OR most are inaccurately reported. |
| Resources | All resources used for quotes and facts are credible and cited correctly using APA format. | Most resources used for quotes and facts are credible and cited correctly using APA format. | Few resources used for quotes and facts are credible and cited not correctly. | Resources used for quotes and facts are less than credible (suspect) and cited not correctly. |
| Grammar | Writer makes no errors in grammar or spelling that distracts the reader from the content. | Writer makes 1-2 errors in grammar or spelling that distract the reader from the content. | Writer makes 3-4 errors in grammar or spelling that distract the reader from the content. | Writer makes more than 4 errors in grammar or spelling that distracts the reader from the content. |

Software Requirements

1. 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.
2. Microsoft Office® - This product is available at the UTEP Bookstore.
3. 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 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 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 any 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.