

# University of Texas at El Paso

## College of Education Department of Teacher Education MTED 5318 (CRN 15993)- Hybrid Teaching & Learning with Technology in the Mathematics Classroom

### Fall 2017 Semester

<b>Class meeting time:</b>	Wednesdays, 5:30pm – 8:20pm
<b>Class meeting location:</b>	Face-to-Face at College of Education, EDUC 402 Online Sessions- Conducted via Blackboard
<b>Instructor's Name:</b>	Dr. Karla Huereca
<b>E-mail:</b>	Through Blackboard or via utep e-mail at <a href="mailto:khuereca@utep.edu">khuereca@utep.edu</a>
<b>Office Hours:</b>	Face to Face on Wednesdays <ul style="list-style-type: none"><li>▪ 5:00pm – 5:30pm</li><li>▪ 8:20pm – 9:20pm</li></ul> Online on Saturdays <ul style="list-style-type: none"><li>▪ 8:30am – 10:00am</li></ul> By Appointment

**NOTE:** This syllabus is subject to change as needed. Any changes to this syllabus will be announced in class and/or via Blackboard.

### **Students with Disabilities statement:**

If you have or believe you have a disability, you may wish to self-identify. You can do so by providing documentation to the Center for Accommodations and Support Services (CASS) located in Union E Room 106. Students who have been designated as having a disability must reactivate their standing with CASS on a yearly basis. Failure to report to this office will place a student on the inactive list and nullify benefits received. If you have a condition which may affect your ability to exit safely from the premises in an emergency or which may cause an emergency during class, you are encouraged to discuss this in confidence with the instructor and/or the director of CASS. You may call 747-5148 for general information about the Americans with Disabilities Act (ADA).

### **Equal Educational Opportunity**

In order to create equal educational opportunities in the class, all students are expected to demonstrate respect for the diverse voices and individual differences in the class. Particularly, no person shall be excluded from participation in, denied benefits of, or be subject to discrimination under any program or activity sponsored or conducted by the University of Texas at El Paso on the basis of race, color, national origin, religion, sex, age, veteran status, disability, or sexual orientation. Any member of the University community

who engages in discrimination or other conduct in violation of University policy is subject to the full range of disciplinary action, up to and including separation from the University. Complaints regarding discrimination should be reported to the University's Equal Opportunity Office. Inquiries regarding applicable policies should be addressed to the University's Equal Opportunity Office, Kelly Hall, 3rd Floor, [915.747.5662](tel:915.747.5662) or [eoaa@utep.edu](mailto:eoaa@utep.edu).

### **Required Readings and/or Resources:**

- Texas Essential Knowledge and Skills (TEKS) for all grade levels of Mathematics.
  - <http://tea.texas.gov/curriculum/teks/>
- Texas College Reading Standards
  - <http://www.thecb.state.tx.us/collegereadiness/CRS.pdf>
- TExES Website
  - <http://www.texas.ets.org/texas/>
- TExEs Mathematical Content and Pedagogy and Professional Responsibilities (PPR) Preparation Manuals
  - <http://www.texas.ets.org/texas/prepmaterials/>
- SBEC Website
  - <http://www.sbec.state.tx.us/SBECOnline/default.asp>
- Common Core Standards
  - <http://www.corestandards.org/>
- National Council for Teachers of Mathematics (NCTM)
  - <http://www.nctm.org>
- Strategic use of history of mathematics education and the NCTM standards
  - <http://www.education.com/reference/article/history-mathematics-education-NCTM/>
- International Society for Technology in Education
  - <http://www.iste.org/standards/standards/standards-for-teachers>
- Trends in International Mathematics and Science Study
  - <http://timssandpirls/bc.edu/>
  - <http://timssvideo.com>

### **UTEP Library website:**

Resources are also available via our UTEP's Academic Search Complete (EBSCO), free of cost. Visit [www.utep.edu](http://www.utep.edu) and go to the library link to access additional documents, as needed.

### **Other Required Readings and Handouts:**

Other readings will be utilized throughout the course of the fall semester. I will provide these and/or other course reading requirements as we begin instruction and in order to adjust learning based on students' needs. Please continue to check your Blackboard for further instructions and/or discussions.

Handouts and documents necessary for instructional purposes will be provided to you in class and/or via blackboard, as needed. Please continue to check your Blackboard for further instructions and/or discussions.

## Course Objectives

During the progress of this course, we will continuously learn, examine, and discuss diverse theories regarding the various types of technology to teach mathematics and/or integrated STEM disciplines. As such, students are expected to apply their learning appropriately, through inquiry-based experiences, as they emerge during face-to-face or online meetings. Students are expected to reflect upon their own experiences and beliefs about mathematics teaching and learning.

The objectives of the course are:

- To study current research trends and issues in the use of technology for teaching and learning of mathematics.
- To actively participate in discussions regarding topics that relate to the use of technology in the mathematics classrooms.
- To collaborate with others in the understanding of technology implementation, including web-based resources and open source materials.
- To examine areas of technology education research that is most applicable to advancing the teaching and learning of mathematics.

## Course Structure:

- This course is a hybrid course; thus, it will comprise both face-to-face and online sessions. Each face-to-face class session will consist of brief lecture and/or discussions with appropriate student presentations and problem solving activities aligned to the weekly assigned topics.
- Students are expected to take notes during each class session.
- During online sessions, students are expected to follow guidelines as given via Blackboard, including reading of mathematics education paper and chapters, conducting research using various electronic databases, write reflections, and participate in online discussions.

## Course Requirements:

- Students are expected to attend and actively participate in all class sessions (either online or face-to-face).
- Students are expected to prepare for each session to contribute to the discussions of the topics being presented. 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 integrating technology in the mathematics classroom.
- Attendance and participation are critical to the success of students in this course. Attendance will be taken each meeting using a sign-in sheet. It is the students' responsibility to sign in every time there is a class session. Similarly, it is expected for students to portray a positive attitude towards learning during each class session and vital to the contributions of the class discussions.
- Due to the collaborative nature of this course and the group activities/discussions intended to occur, any missed class session will hinder students' performance in the course.
- Late arrivals, early departures, or nonparticipation in class may negatively impact students' final grade in the course.
- Students are expected to adhere to the official UTEP attendance policy. **More than two absences may result in a student being dropped from the course.**

## Course Readings and Assignments:

- Assigned readings are a vital aspect of this course. Students will be expected to write reflections on assigned readings, research, and create their own mathematical activities, integrating technology.
- Topics and reading assignments will be based on students' needs and may cause changes in the syllabus at any point of the course. Any changes will be announced during class and/or via Blackboard. Students are responsible for obtaining any changes, even when not present.
- Students are expected to follow APA format guidelines when submitting assignments. This includes spellchecking and the use of correct grammar.
- Formative assessments may be used on assigned readings, as needed.
- There will be various individual and/or group presentations during the progress of the course.
- Students are expected to collaborate with classmates to prepare and give in-class presentations.

## Academic Dishonesty:

Students are expected to abide by UTEP's standards and follow students' code of conduct at all times. Any student who fails to adhere to academic standards or found in any form of scholastic dishonesty will be subject to disciplinary action. Academic dishonesty includes, but is not limited to, cheating, plagiarism, and submission in part or whole of others' work. 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 may be suspended or expelled from UTEP for the above-mentioned actions or any other behavior that violates the UTEP Handbook of Operating Procedures.*

## Students' learning Outcomes:

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

	Student Learning Outcomes	Assessment
1	Develop an understanding of current issues, practices and directions in mathematics curriculum and strategic use of technology in the teaching and learning of mathematics.	<ul style="list-style-type: none"><li>○ Assigned readings and discussions</li><li>○ Student presentations</li><li>○ Formative assessments</li><li>○ Exams</li></ul>
2	Develop knowledge and skills in using selected educational technology	<ul style="list-style-type: none"><li>○ Assigned readings and discussions</li><li>○ Student presentations</li><li>○ Formative assessments</li><li>○ Exams</li></ul>
3	Identify and analyze effective strategies for using content-specific mathematics technology tools. Develop understanding on how such technology tools support students in exploring and identifying mathematical concepts and	<ul style="list-style-type: none"><li>○ Assigned readings and discussions</li><li>○ Student presentations</li><li>○ Formative assessments</li><li>○ Exams</li></ul>

	relationships.	
4	Identify and analyze effective applications of content-neutral technologies that potentially may increase students' access to information and ideas and may enhance student-student and student-teacher interactions to support and enrich sense-making.	<ul style="list-style-type: none"> <li>○ Assigned readings and discussions</li> <li>○ Student presentations</li> <li>○ Formative assessments</li> <li>○ Exams</li> </ul>
5	Educators must be able to make knowledgeable decisions, develop skills that will help them to determine when and how technology can enhance students' learning.	<ul style="list-style-type: none"> <li>○ Assigned readings and discussions</li> <li>○ Student presentations</li> <li>○ Formative assessments</li> <li>○ Exams</li> </ul>
6	Increase individual's confidence to teach mathematics.	<ul style="list-style-type: none"> <li>○ Assigned readings and discussions</li> <li>○ Student presentations</li> <li>○ Formative assessments</li> <li>○ Exams</li> </ul>
7	Improve ability to manage and assess their pupils' mathematics learning. Discover innovative methods of instruction to increase effectiveness and pupils' engagement, learning, and thinking.	<ul style="list-style-type: none"> <li>○ Assigned readings and discussions</li> <li>○ Student presentations</li> <li>○ Formative assessments</li> <li>○ Exams</li> </ul>
8	Improve capacity to think reflectively and creatively about their teaching of mathematics	<ul style="list-style-type: none"> <li>○ Assigned readings and discussions</li> <li>○ Student presentations</li> <li>○ Formative assessments</li> <li>○ Exams</li> </ul>
9	Increase capacity to become an agent of change in the field of mathematics education	<ul style="list-style-type: none"> <li>○ Assigned readings and discussions</li> <li>○ Student presentations</li> <li>○ Formative assessments</li> <li>○ Exams</li> </ul>

### Course Grading:

Students grade will be determined based on fulfilling course requirements.

Grading will be as follows:

○ Participation and Reading Assignments	20%
○ Reflections/Formative Assessments	25%
○ In-Class Presentations/Discussions	25%
○ Exams	30%
<hr/> Total	100%

### Tentative Course Schedule

<b>Date</b>	<b>Assignment</b>
Week 1: August 30  <b>Face to Face</b>	<u>Course Overview</u> <ul style="list-style-type: none"> <li>▪ Introductory activity &amp; examination of syllabus</li> <li>▪ Presentation of course resources</li> <li>▪ Theoretical analysis of technology integration in mathematics</li> <li>▪ Pre-test</li> </ul>
Week 2: September 6  <b>Online</b>	<u>Research Exploration</u> <ul style="list-style-type: none"> <li>▪ Examining current research of technology integration in mathematics education</li> <li>▪ Follow assignment guidelines under discussion forum via blackboard, if available (Week 2)</li> </ul>
Week 3: September 13  <b>Face to Face</b>	<u>Student Presentations &amp; Examination of TEKS</u> <ul style="list-style-type: none"> <li>▪ Presentations of research from Week 2. Follow rubric guidelines under blackboard</li> <li>▪ Examination of mathematics Texas Essential Knowledge and Skills (TEKS)</li> </ul>
Week 4: September 20  <b>Online</b>	<u>Research Exploration</u> <ul style="list-style-type: none"> <li>▪ Examining current research of technology integration in mathematics education</li> <li>▪ Follow assignment guidelines under discussion forum via blackboard, if available (Week 4)</li> </ul>
Week 5: September 27  <b>Face to Face</b>	<u>Continuation of Research &amp; Presentations</u> <ul style="list-style-type: none"> <li>▪ Hands-On Activities</li> <li>▪ Student Presentations</li> </ul>
Week 6: October 4  <b>Face to Face</b>	<u>Continuation of Research &amp; Presentations</u> <ul style="list-style-type: none"> <li>▪ Hands-On Activities</li> <li>▪ Student Presentations</li> </ul>
Week 7: October 11  <b>Online</b>	<u>Research Exploration</u> <ul style="list-style-type: none"> <li>▪ Examining current research of technology integration in mathematics education</li> <li>▪ Follow assignment guidelines under discussion forum via blackboard, if available (Week 7)</li> </ul>
Week 8: October 18  <b>Face to Face</b>	<u>Continuation of Research &amp; Presentations</u> <ul style="list-style-type: none"> <li>▪ Hands-On Activities</li> <li>▪ Student Presentations</li> </ul>
Week 9: October 25  <b>Face to Face</b>	<u>Continuation of Research &amp; Presentations</u> <ul style="list-style-type: none"> <li>▪ Hands-On Activities</li> <li>▪ Student Presentations</li> </ul>
Week 10: November 1	<u>Research Exploration</u> <ul style="list-style-type: none"> <li>▪ Examining current research of technology integration in</li> </ul>

<b>Online</b>	<p>mathematics education</p> <ul style="list-style-type: none"> <li>▪ Follow assignment guidelines under discussion forum via blackboard, if available (Week 7)</li> </ul>
<p>Week 11: November 8</p> <p><b>Face to Face</b></p>	<p><u>Continuation of Research &amp; Presentations</u></p> <ul style="list-style-type: none"> <li>▪ Hands-On Activities</li> <li>▪ Student Presentations</li> </ul>
<p>Week 12: November 15</p> <p><b>Face to Face</b></p>	<p><u>Continuation of Research &amp; Presentations</u></p> <ul style="list-style-type: none"> <li>▪ Hands-On Activities</li> <li>▪ Student Presentations</li> </ul>
<p>Week 13: November 22</p> <p><b>Online</b></p>	<p><u>Research Exploration</u></p> <ul style="list-style-type: none"> <li>▪ Examining current research of technology integration in mathematics education</li> </ul> <p>Follow assignment guidelines under discussion forum via blackboard, if available (Week 7)</p>
<p>Week 14: November 29</p> <p><b>Face to Face</b></p>	<p><u>Continuation of Research &amp; Presentations</u></p> <ul style="list-style-type: none"> <li>▪ Hands-On Activities</li> <li>▪ Student Presentations</li> </ul>
<p>Week 15: December 6</p> <p><b>Online</b></p>	<p><u>Research Exploration</u></p> <ul style="list-style-type: none"> <li>▪ Examining current research of technology integration in mathematics education</li> <li>▪ Follow assignment guidelines under discussion forum via blackboard, if available (Week 7)</li> </ul>
<p>Week 16: December 13</p> <p><b>Face to Face</b></p>	<p><u>Final Meeting Day</u></p> <ul style="list-style-type: none"> <li>▪ Final Exam Administration- Final will start at 6:00pm</li> <li>▪ Final Post-Test</li> </ul>

### 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.**

### Appendices- Relevant Rubrics:

#### Grading Rubric for Online Discussions

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 topic or pose a question and then abandon it.	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 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.	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 acknowledgment to any responses.

### Grading Rubric for Short Reflection

	<b>Exceeds Standards</b>	<b>Meets Standards</b>	<b>Does not Meet Standards</b>
<b>Points</b>	Good (10-8 pts)	Fair (7-4 pts)	Poor (3-1 pts)
<i>Short Reflection</i>	The piece is thoughtful, engaging, and clearly 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.	Shows adequate reflection along with 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.	Does not adequately address the question or prompt, and shows limited thoughtfulness.

### Grading Rubric for Presentation

	<b>Exceeds Standards</b>	<b>Meets Standards</b>	<b>Does not Meet Standards</b>
<b>Criteria</b>	<b>Good (10-8 pts)</b>	<b>Fair (7-4 pts)</b>	<b>Poor (3-1 pts)</b>
Knowledge of Content and Summary	Solid knowledge and understanding of the topic to be presented is demonstrated. The presentation is clear and understandable.	Good knowledge and understanding of the topic to be presented is demonstrated. The presentation is clear and understandable, but some important points are not addressed.	Weak knowledge and understanding of the topic to be presented is demonstrated. The presentation is unclear.
Critical Thinking and Argumentation (this is applicable only if presenting the review of the article).	Strengths and weaknesses that are central to the key points of the article are addressed. The discussion of strengths and weaknesses take up the majority of the assignment.	Strengths and weaknesses that are peripheral to the article are addressed. The discussion of strengths and weaknesses take up the majority of the assignment.	Strengths and weaknesses are addressed peripherally or not at all. The discussion of strengths and weaknesses take up only a small part of the assignment.
Organization and Communication Accuracy	The presentation is well organized, has a very clear intro, body and conclusion. The purpose of the presentation is clear from the very beginning. There are no grammatical errors or typos. APA and page length requirements (if applicable for the assignment) are met.	The presentation is organized, has an intro, body and conclusion. The purpose of the paper becomes clear within the paper. There are few grammatical errors or typos. APA and page length requirements (if applicable for the assignment) are met.	The presentation is not well organized, has an unclear or non-existent intro, body and conclusion. The purpose of the paper is unclear. There are many grammatical errors and/or typos. APA and page length requirements (if applicable for the assignment) are not met.

