

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

Spring 2022

<u>Course</u>	STEM6302 (HYBRID, R, 5:30-8:20PM)
<u>Topic</u>	Teacher Development in STEM Education
<u>Credits</u>	3-0

Course Description

This course examines and analyzes research on the preparation and professional development of STEM educators. Driving questions include: (1) to what extent does teacher knowledge, skill, and disposition affect quality learning and achievement opportunities for students; (2) what kinds of teacher learning experiences are effective in transforming beliefs about teaching practice and learning STEM; and (3) how do teacher education programs as well as national and state standards and policies have an impact on the development of STEM teachers.

Contact Information

Instructor: <i>Mourat A. Tchoshanov</i>	Office Hours: R 5:00-5:30PM & 8:20-8:50PM
Phone: 915-747-7668	E-mail: <i>mouratt@utep.edu</i>
Office: EDU612	Website: http://mourat.utep.edu/

Office Hours online via a video conferencing tool Zoom or Blackboard Collaborate.

Required Readings will be distributed during class sessions and posted on the Blackboard. The readings are also available via UTEP Library.

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

Learning Outcomes

Upon completion of this course, students should be able:

- To examine and analyze research on the preparation and professional development of STEM teachers and educators
- To learn how teacher education programs as well as national and state standards and policies affect the development of STEM teachers
- To reflect on kinds of teacher learning experiences that are effective in transforming beliefs about teaching practice and learning STEM disciplines
- To critique and evaluate the impact teacher knowledge, skill, and disposition have on STEM teaching practice, quality learning, and achievement opportunities for students.

Course Calendar

Week	Activities	Submissions
1.	Introduction and Syllabus Review	Introduction Card
2.	Critique #1: Shulman, L. (1986). Those who understand: Knowledge growth in teaching	Critique-1*
3.	Peer review on critique #1 Individual Conferences	Peer review-1
4.	Critique #2: Koehler, M., et al. (2013). What is technological pedagogical content knowledge (TPACK)?	Critique-2
5.	Peer review on critique #2 Individual Conferences	Peer review-2
6.	Critique #3: Abbitt, A. (2011). Measuring technological pedagogical content knowledge in preservice teacher education Open forum by demand	Critique-3
7.	Peer review on critique #3 Open forum by demand	Peer review-3
8.	Critique #4: Depaepe, F. (2013). Pedagogical content knowledge: A systematic review of the way in which the concept has pervaded mathematics educational research Open forum by demand	Critique-4
9.	Peer review on critique #4 Open forum by demand	Peer review-4
10.	Critique #5: Copur-Gencturk (2021). Teachers' conceptual understanding of fraction operations: national sample of elementary school teachers Open forum by demand	Critique-5
11.	Peer review on critique #5 Open forum by demand	Peer review-5
12.	Critique #6: Yang, Y., et al. (2020). Effects of a professional development program on science teacher knowledge and student understanding Open forum by demand	Critique-6
13.	Peer review on critique #6 Open forum by demand	Peer review-6
14.	Critique #7: Lehrer, R. & Schauble, L. (2020). Stepping carefully: Thinking through the potential pitfalls of integrated STEM Open forum by demand	Critique-7
15.	Peer review on critique #7 Open forum by demand	Peer review-7
16.	Critique #8: Paper of your choice related to the topic of teacher knowledge/development in your area of specialization. Critique-8 Presentation	Critique-8 PP of critique-8

* Note: Assignments are due on corresponding Sundays at 11:59PM

Course Communication

Since this is a hybrid course, contact will be limited to electronic communication. There are various ways we can keep "in touch":

- Via video conferencing during my Office Hours (stated at the beginning of this syllabus).
- Via email using either the mail tool in Blackboard, or my UTEP e-mail also shown at the beginning of the syllabus.
- Via the Questions and Concerns Board in the discussion area of the course. I will check frequently to provide feedback and answer your inquiries.

I will be checking my e-mail and the Blackboard once a day, and my responses shouldn't take more than 48 hours. This provides me with enough time to answer all your questions, so do take this into consideration.

Course Assignments

1. **Critique** (8-10 pages, double spaced, APA style, Word): each student will write critiques addressing assigned readings.
2. **Peer-review** (2-3 pages, double spaced): each student (this assignment is for doctoral students only) will write blind reviews to assigned peer critiques.
3. **Critique-8 Presentation**: each student will present the critique of the paper of your choice related to the topic of teacher knowledge in your area of specialization as a Power Point Presentation.

Grade Distribution

Critiques	8 critiques x 9 points each = 72 points
Peer Reviews	8 reviews x 2 points each = 16 points
Critique-8 Presentation	12 points

Grading Scale

You are encouraged to demonstrate *knowledge of content/ issue you intend to critique, critical thinking, and communication accuracy* while completing major course assignments.

Doctoral Students: 91 - 100 = **A** 81- 90 = **B** 71 - 80 = **C** 61 - 70 = **D** 00 - 60 = **F**

How to Write a Critique/Review

To write a critique/review of a text is to analyze and evaluate it, not just summarize or synthesize. A summary merely reports what the text said, that is, it answers only the question, "What did the author say?" A critique, on the other hand, analyzes, interprets, and evaluates the text, answering the questions How? Why? and How Well? A critique does not necessarily have to criticize the piece in a negative

sense. Your reaction to the text may be largely positive, negative, or a combination of the two. It is important to explain why you respond to the text in a certain way.

So, the critique is a rigorous critical reading of a text (e.g., article, chapter, passage). Thus, the critique's value, as an academic document, rests on your ability to say precisely *why you agree or disagree*. The structure of the critique may include the following main parts:

- **Abstract** which briefly introduces the paper. It should also provide your readers with understanding why this critique is worth reading. In the abstract, you should *clearly state the point(s) you are to critique*, a brief rationale for selecting the point(s), and the arguments you intend to make about it.
- **Summary**. It includes an overview of the paper, making sure to use adequate transitions between parts so that *the writing flows smoothly*.
- **Analysis** of the author's discussion of the selected point(s). Present an in-depth analysis of the validity of the author's logic and use of evidence in supporting the selected point(s). Be sure to present your information in a form, which is easy to follow, using *transitional elements* whenever necessary to preserve the *smooth flow of your writing*.
- **Response**. As discussed above, you may agree or disagree with the author's point(s), and this is the part of the critique where you make your own views on the point(s) clear. Remember that your arguments must be well-supported through the extensive use of *references, evidence and/or logic*. You must give compelling reasons for your agreement or disagreement with the author. Discuss the limitations, weaknesses, or problems of the text.
- **Conclusion**. Synthesize your critique: *what do you take away from the paper*. Evaluate the author's overall success or failure in achieving his or her point(s). Also, remind your reader of the strengths and weaknesses of the paper.

Once the critique is drafted, revise it, making sure you have emphasized the most salient points in your discussion. Check your *sentence variety, your organization, and your word choice*. Is the critique all it can be? Have you edited the critique to eliminate errors in spelling, sentence structure, and agreement?

Rubrics for Critique

Criteria	Good (9 points)	Fair (5 points)	Poor (2 points)
Knowledge of Content	Solid knowledge and understanding of the issue to be critiqued is demonstrated. The article is clearly but succinctly summarized - the key points of the article are addressed.	Good knowledge and understanding of the issue to be critiqued is demonstrated. The article is clearly summarized, but some sub points are addressed along with main points. The summary is not succinct.	Weak knowledge and understanding of the issue to be critiqued is demonstrated. The article summary is unclear or overly detailed.
Critical Thinking and Argumentation	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	Paper is well organized, has a very clear intro, body and conclusion. The purpose of the paper is clear from the very beginning. There are no grammatical errors or typos. APA and page length requirements are met.	Paper 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 are met.	Paper 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 are not met.
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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, do not resubmit work completed for other classes without specific acknowledgment and permission from the instructor. Violations are unacceptable and required to be referred to the Dean of Students Office for possible disciplinary action.

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.

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 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.

Netiquette Statement

Netiquette, or network etiquette, refers to the guidelines and recommended practices for online communications.

Be respectful. Remember that you are communicating with actual people. Always be courteous and show respect, especially when there are differences of opinion. Remember the golden rule: treat others as you would like to be treated!

Think before you post. Be aware of who may be able to view your posting, and how your post may be interpreted. Try to maintain a fair and objective tone.

Stay on topic. Make sure your communication is related to the subject at hand and does not wander off-topic.

Write clearly. Even though the online environment may seem more informal than your face-to-face class, this is still an academic course and intelligible: mature communication is expected. Correct spelling and grammar are required: proper composition and punctuation are expected.

Use appropriate language and style. Profanity or offensive wording will not be tolerated. You should avoid using ALL CAPS and repeated punctuation (???? or !!!).

Be considerate of others. Do not make derogatory, condescending, or harassing remarks. Communication should be well-intentioned, well-articulated, and aimed at fostering a positive learning environment. Be aware of how sarcasm may be misinterpreted by your readers.

Allow for misunderstandings. Keep in mind that writing often conveys the incorrect tone or intention in the absence of nonverbal communication. You should make allowances. What you may perceive as rudeness may be unintended.

Cite your sources. If you post work that is not your own, be sure to reference your sources.

ADA Statement

In Section 504 of the Vocational Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) of 1990, if a student needs an accommodation then the Office of Disabled Student Services located at UTEP need to be contacted. If you have a condition, which may affect your ability to perform successfully in this course, you are encouraged to discuss this in confidence with the instructor and/or the director of the Disabled Student Services. You may call (915)747-5148 for general information about the American with Disabilities Act (ADA) and the rights that you have as a UTEP student with a disability. Individuals with disabilities have the right to equal access and opportunity. It is the student's responsibility to contact the instructor and the UTEP Disabled Student Services Office.

Equal Educational Opportunity Statement

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 or eoaa@utep.edu.

Statement Regarding COVID-19 Accommodations

Students are not permitted on campus when they have a positive COVID-19 test, exposure or symptoms. If you are not permitted on campus, you should contact me as soon as possible so we can arrange necessary and appropriate accommodations. Students who are considered high risk according to CDC guidelines and have an ongoing medical condition and/or those who live with individuals who are considered high risk who also have an ongoing medical condition may contact Center for Accommodations and Support Services (CASS) to discuss temporary accommodations for on-campus courses and activities. Apply at cassportal.utep.edu and fill out a three-question application. You will be scheduled to meet with disability coordinator to discuss your unique situation.