EDUC 5386.060
HISTORY OF STEM EDUCATION
Fall 2024

Section:	5386.060	**Instructor:**	Brandon L. Bretl, PhD
Days:	Asynchronous	**Email:**	bbretl@uttyler.edu
Times:	Asynchronous	**Phone:**	903-566-7390
Location:	Canvas, Online	**Office:**	BEP 246
		Office Hrs:	TuTh 11:00 am – 1:00 pm (or upon request)

Course Description

This course investigates the history of the teaching and learning of Science, Technology, Engineering, and Mathematics (STEM) content for the purpose of informing current theory and practice in the field. The course reviews content and pedagogical practices from about 1800 AD to present.

Required Textbook
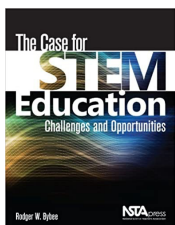
Digital version available for FREE via UT Library and Canvas.

Bybee, R. W. (2013). The Case for STEM Education: Challenges and Opportunities. Arlington, VA: National Science Teachers Association.

ISBN-13: 978-1936959259

Student Learning Outcomes

- The student is expected to examine the historical underpinnings of today's integrated STEM education practices.
    - (Texas Educator Standards: 1ai, 1aiii, 1bi, and 1cii; 2bi, 2ciii)
    - (INTASC Standards: 1, 2, and 7)
- The student is expected to construct a timeline of historical events that have helped to shape today's STEM education practices.
    - (Texas Educator Standards: 1ai, 1aiii, 1bi, and 1cii; 2bi, 2ciii)
    - (INTASC Standards: 1, 2, and 7)
- The student is expected to synthesize available literature examining the history of teaching and learning STEM content for underrepresented populations.

- o (Texas Educator Standards: 1ai, 1aii, 1aiii, 1bi, 1biii and 1cii; 2ai, 2bi, 2bii, 2biii, and 2ciii; 3ai, 3aii, 3aiii, 3bi, 3bii, 3biii, 3ci, 3cii, and 3ciii; 5ai; 6ai)
  - o (INTASC Standards: 1, 2, 4, 5, 7, and 8)
- The student is expected to critically evaluate the influence a historical leader in STEM has had on STEM Education.
  - o (Texas Educator Standards: 1bii 1biii, 1ci; 2bi, 2bii, 2biii, and 2ciii; 3ai, 3aii, 3aiii, 3bi, 3bii, 3biii, 3ci, 3cii, and 3ciii)
  - o (INTASC Standards: 1, 2, 4, 5, and 8)

Course Policies and Expectations

Civility

I expect everyone to approach others in class with a sincere intention to treat one another fairly and respectfully. We are all here to learn. I will give you that chance, and I expect you give me and your classmates that chance as well. This includes treating everyone with respect and kindness. If at any time during the semester you feel uncomfortable, please let me know. I can either address the issue or refer the issue to the appropriate resources on campus. Expressions or actions that disparage a person's or group's race, ethnicity, gender, gender identity, religion, sexual orientation, marital status, parental status, age, or disability are contrary to the mission of the course, department, and university and will not be tolerated.

Course Environment, Attendance, and Assignments

- This course is asynchronous, meaning that you are expected to move through materials on your own schedule while meeting all due dates.
- Attendance is taken through your participation in discussion boards and assignment submission. The date of the last submitted assignment will be considered the last day of attendance for issues related to financial aid, etc.
- No late assignments will be accepted unless a valid pre-approved or medical reason has been discussed with the professor. If an assignment is not completed on time due to a documented illness, funeral, or other university related activity, then a make-up date can be scheduled with the professor. All late assignments or non-submitted assignments will receive a score of zero points.

Written Assignments

All written assignments should be typed (double-spaced, Times New Roman, 12-point font) and submitted by midnight Central Standard Time on the due date. All written assignments should be submitted through the assignment link that I will provide. Please name written assignments using the following convention: last name, first initial, assignment title (ex. Last_F_Assignmenttitle). Late assignments will not be accepted and will receive a score of 0. Assignments completed for other courses may NOT be turned in for this course and will be considered academic dishonesty.

For general guidance about writing in my class, see this scene from the film "A River Runs Through It" https://www.youtube.com/watch?v=gA-sEfXOaEQ

Artificial Intelligence Policy (AI Policy)

UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased.

Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the guidelines specified for this course (see below) is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler's Academic Integrity Policy.

For this course, you can use AI programs (ChatGPT, Copilot, etc.). These programs can be powerful tools for learning and other productive pursuits, including completing assignments in less time, helping you generate new ideas, or serving as a personalized learning tool. However, your ethical responsibilities as a student remain the same. You must follow UT Tyler's Honor Code and uphold the highest standards of academic honesty. This applies to all uncited or improperly cited content, whether created by a human or in collaboration with an AI tool. If you use an AI tool to develop content for an assignment, you must cite the tool's contribution to your work.

Contacting Dr. Bretl
Email is the best way to reach me. I make every effort to respond to emails within 24 hrs

Student Assignments & Projects
The course is designed to be delivered in a "module format." Course materials will be organized into weekly modules. Each module will usually consist of readings, quizzes, discussion prompts, written assignments, and other activities. Each week will follow a relatively consistent pattern.

Readings
Readings will consist of chapters from the textbook and supplemental readings from research papers, books, and other textbooks provided on Canvas. It will be important that you complete assigned readings on time so you are prepared to participate in discussions. I also often provide enrichment materials that are optional but will provide a more in-depth or challenging perspective on a topic for those students who want to dig deeper into an area of interest.

Lectures
Lectures will be short, recorded videos posted on Canvas. Lectures are mandatory and content from lectures will appear in quizzes and other assignments.

Quizzes
There will be several short quizzes in the semester. These will be delivered online and will serve to provide a check of your understanding. Late quizzes will not be accepted and will receive a score of 0.

Discussion Posts
You occasionally be assigned discussion posts with a prompt or question from the readings. Responses should be concise, to the point, and well thought out.

Historical Timeline
Science Technology Engineering and Mathematics instruction throughout the last two centuries has evolved due to scientific accomplishments and inventions as well as pedagogical theory. Students will be expected to construct a timeline of historical people, programs, events, etc. since 1893 AD and the Committee of TEN that helped shape STEM education as we currently understand it.

Book Report
Students will be required to select a Biography or Autobiography of an individual who has been influential in STEM education during any time. The students will then create a video Book Report no less than 5 minutes and not to exceed 10 minutes in length that summarizes the content of the book and provides the students' reaction/reflection to its content.

Oral History Research Report
Students will be grouped into pairs. Each student in each pair will conduct two interviews with individuals whose story would help the students answer a research question related to STEM education for underrepresented populations (i.e., women, non-white, low-SES, etc.). Each group is expected to research literature and use their interview data to construct a paper synthesizes both the review of literature and oral-history data.

Intervention Proposal Paper
Based on historical evidence and current research in the field, you will be asked to write a brief one-page proposal for an intervention at the local, state, or national level. The idea is to identify a modern problem and apply knowledge from the history of STEM in proposing a solution.

Tentative Assignments
Due dates will be provided on Canvas for all assignments.

Grade Item	Total Points
Quizzes	5 points each X 10 quizzes = 50 total
Discussion Posts	10 points each X 5 posts = 50
Historical Timeline	100 points
Book Report	100 points
Oral History Research Report	200 points
Intervention Proposal Paper	50 points
Total	550 points

Please note: The number, content focus, and point value of all assessments and assignments is an approximation and may change.

Letter Grades
A: 90.00% of points or above
B: 80.00% -89.999% of points
C: 70.00% - 79.999% of points
D: 60.00% -69.999% of points F: 59.999% of points or below

Course Topics Outline

Course topics and outline will be provided on Canvas in the form of weekly modules.

Note: These topics and timeline are subject to change.

UT Tyler Resources for Students
- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu, http://www.uttyler.edu/writingcenter/
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu, https://www.uttyler.edu/tutoring/
- The Mathematics Learning Center, RBN 4021, This is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254) https://www.uttyler.edu/counseling/

UNIVERSITY POLICIES

UT Tyler Honor Code
Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

For a full list of university policies including information related to the topics listed below, click here.
- Students Rights and Responsibilities
- Campus Carry
- Tobacco-Free University
- Grade Replacement/Forgiveness and Census Date Policies
- State-Mandated Course Drop Policy
- Disability Services
- Student Absence due to Religious Observance
- Student Absence for University-Sponsored Events and Activities
- Social Security and FERPA Statement
- Emergency Exits and Evacuation
- Student Standards of Academic Conduct

UT Tyler Resources for Students:

- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu,http://www.uttyler.edu/writingcenter/
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu,https://www.uttyler.edu/tutoring/
- The Mathematics Learning Center, RBN 4021, This is the open access computer lab for mathstudents, with tutors on duty to assist students who are enrolled in early-career courses.
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University Guidelines, Links and Policies

COLLEGE OF EDUCATION AND PSYCHOLOGY (CEP) VISION AND MISSION

Vision: The College of Education and Psychology is nationally recognized and respected for its academicprograms and opportunities. It is a center of academic excellence, scholarly inquiry, and public service. The College prepares leaders to meet the critical challenges of the 21st Century through productive contributions to local and global communities and toward individual and cultural equity.
Mission: The mission of the College of Education and Psychology is to provide a positive environment that fosters the acquisition of knowledge and skills. The mission is individually and collectively realized through a community of scholars that contributes to knowledge through scholarly inquiry; organizes knowledge for application, understanding and communication; and provides leadership and service. We affirm and promote global perspectives that value individual and cultural diversity to enhance learning, service, and scholarship.

UT TYLER'S SCHOOL OF EDUCATION STANDARDS FOR EDUCATOR PREPARATION PROGRAMS

Texas Education Standards: The School of Education are committed to teaching and implementing theTexas Educator Standards at the highest level. The School of Education faculty use the Texas Education Standards, along with the Interstate New Teacher Assessment and Support Consortium (InTASC) standards used by educator preparation programs throughout the United States.

The list of Texas Education Standards can be accessed here.

Access the Code of Ethics and Standard Practices for Texas Educators.