

EDUK 522.110, CRN 80565, Teaching Math and Science in the Elementary School
Fall 2017 rev. 08.16.2017
Texas A&M University-Central Texas

INSTRUCTOR AND CONTACT INFORMATION

Instructor: Christina Hamilton, Ph.D.

Office: Warrior Hall 322P

Phone: 254-519-5768

Email: hamilton.c@tamuct.edu

Preferred email is through Blackboard "Messages" for course-related information. If correspondence is not related to the course, contact the professor via hamilton.c@tamuct.edu.

Office Hours:

Mondays 9:00 a.m. to 10:45 a.m., Tuesday 9:00 a.m. to 11:30 a.m., Wednesday 9:00 a.m., to 10:15 a.m. and Thursday 1-5:30. Due to university obligations that may interfere with my office hours, it is RECOMMENDED that you schedule an appointment by contacting me at hamilton.c@tamuct.edu prior to arrival.

Mode of instruction and course access:

This course meets face-to-face with online components and uses the A&M-Central Texas Canvas Learning Management System [<https://tamuct.instructure.com>].

Student-instructor interaction:

If immediate assistance is needed, please call the number above or email at hamilton.c@tamuct.edu. I am also available via Blackboard Collaborate. Individual conferences may be requested by appointment from the student and/or instructor and will meet prior to or after class. General Canvas message requests will be checked daily and will receive a reply no later than 48 hours. It is the responsibility of the student to regularly check course announcements and the assignment calendar for up-to-date communication.

911 Cellular:

Emergency Warning System for Texas A&M University – Central Texas

911Cellular is an emergency notification service that gives Texas A&M University-Central Texas the ability to communicate health and safety emergency information quickly via email, text message, and social media. All students are automatically enrolled in 911 Cellular through their myCT email account.

Connect at [911Cellular](https://portal.publicsafetycloud.net/Texas-AM-Central/alert-management) [<https://portal.publicsafetycloud.net/Texas-AM-Central/alert-management>] to change where you receive your alerts or to opt out. By staying enrolled in 911Cellular, university officials can quickly pass on safety-related information, regardless of your location.

COURSE INFORMATION

Course Overview and description:

This course is an advanced study of methods and materials for the teaching of math and science. Emphasis will be on helping teachers become more effective in teaching math and science by developing questions, investigations, speculations, and explorations that reflect not only the content of each area of study, but the process involved in learning.

Course Objective:

The objective of the course is to provide teachers with information concerning the current basic concepts and skills and educational methodologies in mathematics and science content areas. It is essential that educators have an understanding of the different theories of learning and the unique developmental characteristics of PreK-5 children and apply this knowledge to the teaching of mathematics and science.

Course Understandings

- The educator will understand different theories of learning and child development as they apply to teaching mathematics and science.
- The educator will analyze professional readings related to current trends in the theory and practice of mathematics and science education.
- The educator will apply content knowledge and pedagogical knowledge to the creation and demonstration of lessons that teach basic mathematics and science skills and concepts to PreK-4 children.
- The educator will understand and identify common misconceptions and error patterns related to learning science and mathematics and apply strategies to correct students' understandings.

Student Learning Outcomes:

Knowledge Outcomes

- Examine different theories of learning and child development as they apply to teaching mathematics and science.
- Analyze professional readings concerning mathematics and science concepts and skills, instruction, assessments, misconceptions, and/or standards.
- The educator will understand and identify common misconceptions and error patterns related to learning science and mathematics and apply strategies to correct students' understandings.

Skills Outcomes

- Use a variety of instructional models and strategies to create lessons in mathematics and science that teach basic mathematics and science skills and concepts to PreK-5 children.
- Demonstrate appropriate use of a selected instructional model.

Competency Goals Statements (certification or standards):

Texas Teacher Standards

Standard 3--Content Knowledge and Expertise. Teachers exhibit a comprehensive understanding of their content, discipline, and related pedagogy as demonstrated through the quality of the design and execution of lessons and their ability to match objectives and activities to relevant state standards.

Standard 6--Professional Practices and Responsibilities. Teachers consistently hold themselves to a high standard for individual development, pursue leadership opportunities, collaborate with other educational professionals, communicate regularly with stakeholders, maintain professional relationships, comply with all campus and school district policies, and conduct themselves ethically and with integrity.

PEDAGOGY AND PROFESSIONAL RESPONSIBILITIES STANDARDS (PPR) (EC-GRADE 12)

Standard I. The teacher designs instruction appropriate for all students that reflects an understanding of relevant content and is based on continuous and appropriate assessment.

InTAC standards

The Learner and Learning

- **Standard 1: Learner Development**—The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
- **Standard 2: Learning Differences**—The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.

Content

- **Standard 4: Content Knowledge**—The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make the discipline accessible and meaningful for learners to assure mastery of the content.
- **Standard 5: Application of Content**—The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

Instructional Practice

- **Standard 6: Assessment**—The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
- **Standard 7: Planning for Instruction**—The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
- **Standard 8: Instructional Strategies**—The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.

Professional Responsibility

- **Standard 9: Professional Learning and Ethical Practice**—The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

Required Reading and Textbook(s):

Required:

- Boaler, J. (2015). *Mathematical Mindsets: Unleashing Students' Potential through Creative Math, Inspiring Messages and Innovative Teaching* 1st Edition. Jossey-Bass. ISBN-10: 0470894520, ISBN-13: 978-0470894521
- Charlesworth, R. (2015). *Math and Science for Young Children*, 8th Edition. Cengage Learning
ISBN-13: 978-1305088955, ISBN-10: 1305088956

This is an e-book and is available in the TAMUCT online library

Ernest, P., Greer, B., & Sriraman, B. (2009). *Critical Issues in Mathematics Education*.
Charlotte, N.C.: Information Age Publishing

COURSE REQUIREMENTS

Students must produce original work and properly cite the source(s) of the information to receive credit for writing. **Quoting or paraphrasing that closely mirrors the source (textbook or other reference material) will receive no credit even if properly cited.**

All assignments should be written in proper APA style. Students must follow the APA style guidelines provided by the American Psychological Association at www.apastyle.org

Students are responsible for meeting the course requirements as scheduled for each module in the course calendar. **Assignments may not be submitted for credit after the due date (no late work / no make-up work accepted for credit). A grade of ZERO will be given to missed assignments.**

Critical Issues in Math and/or Science Paper and Presentation

The idea of a professional book review is to briefly summarize the ideas of the book, but mainly to give your opinion about the book's merits – it is a critical analysis of the book. For this assignment, you are to select a chapter from the book *Critical Issues in Mathematics Education* and write a book chapter review. You will also present your paper to the class. This assignment expectations and grading rubric is available in Canvas. The due date is listed in the course calendar. Texas Teacher Standard 3,6, PPR Standard 1, InTAC Standard 1-9

Book Study Reflection

The notion of having a growth mindset is a recent phenomenon in mathematics education. The growth mindset speaks to the point that one who have a mindset to grow in their mathematical abilities will open opportunities towards mathematical as well as all levels of

achievement. For this assignment, you are to read the book *Mathematical Mindsets: Unleashing Students' Potential through Creative Math, Inspiring Messages and Innovative Teaching* by Jo Boaler and provide a written summary and reflection for each chapter. You are to turn in your summary as well as use it to participate in our class discussions. This assignment expectations and grading rubric is available in Canvas. The due date is listed in the course calendar. Texas Teacher Standard 3,6, PPR Standard 1, InTAC Standard 1-9

S.T.E.M. / S.T.E.A.M Paper

The increased attention placed on S.T.E.M. / S.T.E.A.M. initiatives has shifted the mindset of many students, educators, parents, schools and states in regards to education. For this assignment, you are to write a 3-5 page paper about an S.T.E.M. / S.T.E.A.M related topic of choice. The paper will follow APA format and will include at least ten (10) references. This assignment expectations and grading rubric is available in Canvas. The due date is listed in the course calendar. Texas Teacher Standard 3,6, PPR Standard 1, InTAC Standard 1-9

Journal Article Analysis

Critically analyzing research is an avenue to learn best practices in education for professional growth. For this assignment, you are to compare and contrast two related journal articles pertaining to concepts and skills, instruction, assessments, misconceptions, and/or standards in math and science. This assignment expectations and grading rubric is available in Canvas. The due date is listed in the course calendar. Texas Teacher Standard 3,6, PPR Standard 1, InTAC Standard 1-9

Analyze Math and/or Science Teaching

Observing and analyzing teaching is a way to gain new perspective on ideas about how to enhance learning for your students. For this assignment, you are to view several online teaching videos from the PACT library. For each video, you will analyze the teaching for specific information. You will then engage in a class discussion pertaining to your observation and analysis. This assignment expectations and grading rubric is available in Canvas. The due date is listed in the course calendar. Texas Teacher Standard 3,6 PPR Standard 1, InTAC Standard 1-9

Math and Science Presentations

An effective strategy to use while lesson planning is to demo your activities prior to presenting them to students. For this assignment, you are to demo a science and math mini-activity using the class as your students. This assignment expectations and grading rubric is available in Canvas. The due date is listed in the course calendar. Texas Teacher Standard 3,6, PPR Standard 1, InTAC Standard 1-9

Critical Issues in Math and/or Science Paper and Presentation-----	100 pts
Book Study Reflection (3 parts X 25 and Presentation)-----	100 pts.
S.T.E.M. / S.T.E.A.M Paper-----	100 pts.
Journal Article Analysis (2 X 50)-----	100 pts.
Analyze Math and/or Science Teaching (4 parts X 100) -----	400 pts
Math and Science Presentations (2 X 100)-----	200 pts.
Total-----	1000 pts.

Grading Criteria Rubric and Conversion

Points	Grading Scale
900-1000	90-100% = A
800-899	80-89% = B
700-799	70-79% = C
600-699	60-69% = D
Below 599	59-0% = F

Posting of Grades

Grades are not 'given' in this course; they are earned. Students earn grades by actively reading material, by participating in course discussion, and by applying subject-matter content on written assignments. Grades are determined based on the points earned on each assignment. Assignments may not be submitted for credit after the due date (no late work / no make-up work accepted for credit). A grade of ZERO will be given to missed assignments.

COURSE OUTLINE AND CALENDAR

Week: Date	Topic	Assignment <i>All assignments are Due by 11:59 p.m.</i>
1: 8/31	Introductions, Standards, Teaching Math and Science	
August 28, Add/Drop/Late Registration begins August 30, Add/Drop/Late Registration ends, 16-week and 1st 8-week classes September 1, Priority Deadline to Submit Graduation Application		
2: 9/7	<ul style="list-style-type: none"> • Book Study Reflections • Concept Development in Mathematics and Science • Fundamental Concepts and Skills in Mathematics and Science 	Book Study Reflection 1 (Ch. 1,2 and 3) Due 9/5
September 4, Labor Day, CAMPUS CLOSED September 5, Last day to drop 1st 8-week classes with no record		
3: 9/14	Analyzing Topic 1	Analyze Teaching Math and Science 1 Due 9/14
September 13, Last day to drop 16-week classes with no record		
4: 9/21	<ul style="list-style-type: none"> • Book Study Reflection • Teaching Math in the Classroom 	Book Study Reflection 2 (Ch. 4,5 and 6) Due 9/19
September 22, Last day to drop a 1st 8-week class with a Q or withdraw with a W		
5: 9/28	Analyzing Topic 2	Analyze Teaching Math and Science 2 Due 9/28
6: 10/5	Teaching Science in the Classroom- Classroom visit- <i>campus to be announced</i>	
October 6, Deadline to submit graduation		
7:	Teaching Science in the Classroom-	Journal Article Analysis 1 Due

10/12	Classroom visit- <i>campus to be announced</i>	10/10
8: 10/19	<ul style="list-style-type: none"> • Book Study Reflection • Teaching Math in the Classroom 	Book Study Reflection 3 (Ch. 7,8 and 9) Due 10/17
October 20, Last day to withdraw from the University (1st 8-week classes WF)		
9: 10/26	Analyzing Topic 3	Analyze Teaching Math and Science 3 Due 10/26
October 23, Add/Drop/Late Registration begins, 2 nd 8-week classes October 26, Add/Drop/Late Registration ends, 2 nd 8-week classes		
10: 11/2	Teachers Teaching Math and Science Discussion Panel	Journal Article Analysis 2 Due 10/31
October 30, Last day to drop 2 nd 8-week classes with no record		
11: 11/9	Analyzing Topic 4	<ul style="list-style-type: none"> • Analyze Teaching Math and Science 4 Due 11/9
November 10, Veteran's Day November 10, Last day to drop with a Q or withdraw with a W (16-week classes)		
12: 11/16	Critical Issues in Math and/or Science Presentations	Critical Issues in Math and/or Science Paper Due 11/14
November 17, Last day to drop a 2 nd 8-week class with a Q or withdraw with a W		
13: 11/23	Holiday-No Class	
November 23-24, Thanksgiving, CAMPUS CLOSED		
14: 11/30	Math Presentations	
15: 12/7	Science Presentations	
16: 12/14	Course Reflections	S.T.E.M. / S.T.E.A.M Paper Due 12/14
December 15, Last day to withdraw from the University (16-week and 2 nd 8-week classes) December 15, Last day to file for Degree Conferral (Registrar's Office) December 15, Commencement (End of Fall Term) December 25-January 1, WINTER BREAK		

The professor reserves the right to amend this syllabus at any time. If revisions are necessary, the professor will make every effort to provide as much advanced notice as possible.

TECHNOLOGY REQUIREMENTS AND SUPPORT

Technology Requirements.

This course will use the A&M-Central Texas Instructure Canvas learning management system.

Logon to A&M-Central Texas Canvas [<https://tamuct.instructure.com>].

Username: Your MyCT username (xx123 or everything before the "@" in your MyCT e-mail address)

Password: Your MyCT password

Technology Support.

For log-in problems, students should contact Help Desk Central.

24 hours a day, 7 days a week:

Email: helpdesk@tamu.edu

Phone: (254) 519-5466

[Web Chat: \[http://hdc.tamu.edu\]](http://hdc.tamu.edu)

Please let the support technician know you are an A&M-Central Texas student.

For issues with **Canvas**, select “chat with Canvas support,” submit a support request to Canvas Tier 1, or call the Canvas support line: 1-844-757-0953, links to all are found inside of Canvas using the “Help” link.

For issues related to course content and requirements, contact your instructor.

UNIVERSITY RESOURCES, PROCEDURES, AND GUIDELINES

Drop Policy.

If you discover that you need to drop this class, you must complete a [Drop Request Form](https://www.tamuct.edu/registrar/docs/Drop_Request_Form.pdf) [https://www.tamuct.edu/registrar/docs/Drop_Request_Form.pdf].

Professors cannot drop students; this is always the responsibility of the student. The Registrar’s Office will provide a deadline on the University Calendar for which the form must be completed, signed and returned. Once you return the signed form to the Registrar’s Office, you must go into Warrior Web and confirm that you are no longer enrolled. If you still show as enrolled, FOLLOW-UP with the Registrar’s Office immediately. You are to attend class until the procedure is complete to avoid penalty for absence. Should you miss the drop deadline or fail to follow the procedure, you will receive an F in the course, which may affect your financial aid and/or VA educational benefits.

Academic Integrity.

Texas A&M University -Central Texas values the integrity of the academic enterprise and strives for the highest standards of academic conduct. A&M-Central Texas expects its students, faculty, and staff to support the adherence to high standards of personal and scholarly conduct to preserve the honor and integrity of the creative community. Academic integrity is defined as a commitment to honesty, trust, fairness, respect, and responsibility. Any deviation by students from this expectation may result in a failing grade for the assignment and potentially a failing grade for the course. Academic misconduct is any act that improperly affects a true and honest evaluation of a student’s academic performance and includes, but is not limited to, cheating on an examination or other academic work, plagiarism and improper citation of sources, using another student’s work, collusion, and the abuse of resource materials. All academic misconduct concerns will be reported to the university’s Office of Student Conduct. Ignorance of the university’s standards and expectations is never an excuse to act with a lack of integrity. When in doubt on collaboration, citation, or any issue, please contact your instructor before taking a course of action.

Academic Accommodations.

At Texas A&M University-Central Texas, we value an inclusive learning environment where every student has an equal chance to succeed and has the right to a barrier free education.

The Department of Access and Inclusion is responsible for ensuring that students with a disability receive equal access to the University's programs, services and activities. If you believe you have a disability requiring reasonable accommodations please contact the Department of Access and Inclusion at (254) 501-5831. Any information you provide is private and confidential and will be treated as such.

For more information please visit our [Access & Inclusion](https://www.tamuct.edu/student-affairs/access-inclusion.html) webpage
<https://www.tamuct.edu/student-affairs/access-inclusion.html>

Texas A&M University-Central Texas supports students who are pregnant and/or parenting. In accordance with requirements of Title IX and guidance from US Department of Education's Office of Civil Rights, the Dean of Student Affairs' Office can assist students who are pregnant and/or parenting in seeking accommodations related to pregnancy and/or parenting. For more information, please visit <https://www.tamuct.departments/index.php>. Students may also contact the institution's Title IX Coordinator. If you would like to read more about these [requirements and guidelines online](#), please visit the website [<http://www2.ed.gov/about/offices/list/ocr/docs/pregnancy.pdf>].

Tutoring.

Tutoring is available to all A&M-Central Texas students, both on-campus and online. On-campus subjects tutored include Accounting, Advanced Math, Biology, Finance, Statistics, Mathematics, and Study Skills. Tutors are available at the Tutoring Center in Warrior Hall, Suite 111.

If you have a question regarding tutor schedules, need to schedule a tutoring session, are interested in becoming a tutor, or any other question, contact Academic Support Programs at 254-519-5796, or by emailing Larry Davis at lmDavis@tamuct.edu.

Chat live with a tutor 24/7 for almost any subject on your computer! Tutor.com is an online tutoring platform that enables A&M-Central Texas students to log-in and receive FREE online tutoring and writing support. This tool provides tutoring in over forty subject areas. Access Tutor.com through Canvas.

The University Writing Center.

Located in 416 Warrior Hall, the University Writing Center (UWC) at Texas A&M University-Central Texas is a free workspace open to all TAMUCT students from 10am-5pm Monday-Thursday with satellite hours in the University Library on Mondays from 6:00-9:00pm. Students may arrange a one-on-one session with a trained and experienced writing tutor by visiting the UWC during normal operating hours (both half-hour and hour sessions are available) or by making an appointment via [WOnline](https://tamuct.mywconline.com/) [<https://tamuct.mywconline.com/>]. In addition, you can email Dr. Bruce Bowles Jr. at bruce.bowles@tamuct.edu to schedule an online tutoring session. Tutors are prepared to help writers of all levels and abilities at any stage of the writing process.

While tutors will not write, edit, or grade papers, they will assist students in developing more effective composing practices. By providing a practice audience for students' ideas

and writing, our tutors highlight the ways in which they read and interpret students' texts, offering guidance and support throughout the various stages of the writing process. In addition, students may work independently in the UWC by checking out a laptop that runs the Microsoft Office suite and connects to WIFI, or by consulting our resources on writing, including all of the relevant style guides. Whether you need help brainstorming ideas, organizing an essay, proofreading, understanding proper citation practices, or just want a quiet place to work, the University Writing Center is here to help!

If you have any questions about the University Writing Center, please do not hesitate to contact Dr. Bruce Bowles Jr. at bruce.bowles@tamuct.edu.

University Library.

The University Library provides many services in support of research across campus and at a distance. We offer over 200 electronic databases containing approximately 250,000 eBooks and 82,000 journals, in addition to the 72,000 items in our print collection, which can be mailed to students who live more than 50 miles from campus. Research guides for each subject taught at A&M-Central Texas are available through our website to help students navigate these resources. On-campus, the library offers technology including cameras, laptops, microphones, webcams, and digital sound recorders.

Research assistance from a librarian is also available twenty-four hours a day through our online chat service, and at the reference desk when the library is open. Research sessions can be scheduled for more comprehensive assistance, and may take place on Skype or in-person at the library. Assistance may cover many topics, including how to find articles in peer-reviewed journals, how to cite resources, and how to piece together research for written assignments.

Our 27,000-square-foot facility on the A&M-Central Texas main campus includes student lounges, private study rooms, group work spaces, computer labs, family areas suitable for all ages, and many other features. Services such as interlibrary loan, TexShare, binding, and laminating are available. The library frequently offers workshops, tours, readings, and other events. For more information, please visit our [Library website](https://tamuct.libguides.com/) [https://tamuct.libguides.com/].

OPTIONAL POLICY STATEMENTS:

A Note about Sexual Violence at A&M-Central Texas

Sexual violence is a serious safety, social justice, and public health issue. The university offers support for anyone struggling with these issues. University faculty are mandated reporters, so if someone discloses that they were sexually assaulted (or a victim of Domestic/Dating Violence or Stalking) while a student at A&M-Central Texas, faculty members are required to inform the Title IX Office. If you want to discuss any of these issues confidentially, you can do so through Counseling Services (254-501-5956) located on the second floor of Warrior Hall.

Sexual violence can occur on our campus because predators often feel emboldened, and

victims often feel silenced or shamed. It is incumbent on ALL of us to find ways to actively create environments that tell predators we don't agree with their behaviors and tell survivors we will support them. Your actions matter. Don't be a bystander; be an agent of change. For additional information on campus policy and resources visit the [Title IX webpage](https://www.tamuct.edu/departments/compliance/titleix.php) [https://www.tamuct.edu/departments/compliance/titleix.php].

INSTRUCTOR POLICIES.

It is expected that you conduct yourself in such a way that resembles a student with a professional behavior and commitment to the teaching field expectations. Attendance is mandatory. **You are to be in class at least 90% of the time, if your attendance is below this threshold your final grade will be lowered by one (1) full letter.** An excused absence will be granted with a doctor's note or legal documentation provided no later than two days following the absence. Late work will not be accepted unless given prior approval by the professor. In most situations, a doctor's note or legal documentation will be required. In the event of an excused absence (via doctor's note), you are responsible for asking a classmate to take notes and gather handouts or class information for you. It is your responsibility to find out what you missed. *Your professional behavior, including your professional attire, arriving to class late and leaving class early will be monitored and recorded on your professional teaching disposition.*

Copyright Notice.

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