Course Change Request

Date Submitted: 01/30/18 10:00 pm

Viewing: EDCI 726: History and Trends in STEM Education

Last approved: 04/19/17 3:11 am

Last edit: 02/01/18 2:07 pm

Changes proposed by: ambyrrios

Catalog Pages referencing this course:
Department of Teaching, Learning and Culture
EDCI - Educ Curriculum & Dev.

Faculty Senate Number: KS34.251

Contact(s):

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambyrrios Kerri Smith</td>
<td><a href="mailto:ambyrrios@tamu.edu">ambyrrios@tamu.edu</a></td>
<td>9798628122 979-862-3702</td>
</tr>
</tbody>
</table>

Rationale for Course

Edit

- The proposed changes are for accreditation purposes.
- Other

The proposed changes are part of a routine curriculum review.

Explain other rationale

Update for distance education equivalency.

Course prefix: EDCI
Course number: 726
Department: Teaching, Learning & Culture
College/School: Education & Human Development
Academic Level: Graduate
Academic Level (alternate): Undergraduate
Effective term: 2018-2019 2017-2018

Complete Course Title:
History and Trends in STEM Education

Abbreviated Course Title:
HIST TRENDS STEM EDUCATION

Catalog course description:
Exploration of concepts and application of STEM in society; development of understanding of role of engineers, scientists and mathematicians in society; learning basic coding; application of principles to instructional settings.

Prerequisites and Restrictions:
Graduate classification.
Concurrent Enrollment: No
Should catalog prerequisites:

https://nextcatalog.tamu.edu/courseleaf/approve/
concurrent enrollment be enforced?
Crosslistings No Crosslisted With
Stacked No Stacked with

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credit Hour(s)</th>
<th>Contact Hour(s) (per week):</th>
<th>Lecture: 3</th>
<th>Lab: 0</th>
<th>Other: 0</th>
<th>Total: 3</th>
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</thead>
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<tr>
<td>Repeatable for credit?</td>
<td>No</td>
<td></td>
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<tr>
<td>Three-peat?</td>
<td>No</td>
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<td>131390102</td>
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<tr>
<td>Default Grade Mode</td>
<td>Letter Grade(G)</td>
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<tr>
<td>Alternate Grade Modes</td>
<td>Satisfactory/Unsatisfactory</td>
<td></td>
<td></td>
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<tr>
<td>Method of instruction</td>
<td>Lecture</td>
<td></td>
<td></td>
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<tr>
<td>Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education)</td>
<td>Yes</td>
<td></td>
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</tbody>
</table>

Learning Outcomes

Meets traditional face-to-face learning outcomes.

Describe how learning outcomes are met or provide justification why they are not met.

Yes, it will meet the face to face learning outcomes.

Students will complete assignments that have the same time commitment and rigor as they would if they were in a face to face course. Course allows for independent and interactive learning and work.

Hours

Meets traditional face-to-face hours.

Describe how hours are met or provide justification why they are not met.

Yes, it require the same number of contact and study hours as a face to face.

Assignments are designed to engage students rigorously in the course and, between the readings and the assignments, will require the same engagement that a face to face course would.

Will this course be taught as a distance education course? Yes

I verify that I have reviewed the FAQ for Export Control Basics for Distance Education. Yes

Is 100% of this course going to be taught in Texas? Yes

Will classroom space be needed for this course? No

This will be a required course or an elective course for the following programs:

Required (select program)

Elective (select program)

<table>
<thead>
<tr>
<th>Program(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MED-EDCI) Master of Education in Curriculum and Instruction</td>
</tr>
<tr>
<td>(MS-EDCI) Master of Science in Curriculum and Instruction</td>
</tr>
</tbody>
</table>
### Course Syllabus

<table>
<thead>
<tr>
<th>Syllabus:</th>
<th>Upload syllabus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upload syllabus</td>
<td>EDCI 726 Oct 31.docx</td>
</tr>
<tr>
<td></td>
<td>EDCI 726 Syllabus.docx</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Letters of support or other documentation</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reviewer Comments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reported to state?</td>
<td>No</td>
<td></td>
</tr>
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</table>

Key: 16917
EDCI 726: History and Trends in STEM Education
SECTION: 600
TERM: Summer 2018
SCHEDULE: Course is taught on-line
CREDIT: 3 SEMESTER HOURS
PROFESSOR: Dr. Lynn M. Burlbaw
330 Harrington Tower
CONTACT Phone: 979-845-8384
INFORMATION: email: burlbaw@tamu.edu
OFFICE HOURS: TBA

COURSE DESCRIPTION

Explores concepts and application of STEM in society, develop understanding of role of engineers, scientists and mathematicians in society; learn basic coding; application of principles to instructional settings.

REQUIRED TEXTS


Other readings will be made available through eCampus

Students should visit and bookmark the APABlog http://blog.apastyle.org/apastyle/

PREREQUISITE

Graduate Classification; Admission to the STEM On-line Masters Program in TLAC.

COURSE OBJECTIVES/LEARNING OUTCOMES

The objectives/learning outcomes of the course are to assist students to:

1. Understand the place of science, engineering, mathematics and technology in society from a historical perspective.

2. Develop an understanding of concepts associated with STEM education; explain models, both published and personal, and how they change over time.

3. Develop and understanding of the role and responsibility of scientists, mathematicians, and engineers in society.

4. Identify and critique current practices of STEM education in K-12 schools and higher education
5. Develop facility with coding as a means of problem solving and application to classroom activities.

6. Learn how to find published materials using a variety of databases that inform understanding of issues related to STEM education. Access and download reference citations using electronic database software (e.g., RefWorks, EndNotes, Zotero, etc.). Begin the process of creating an electronic database of articles related to STEM.

### COURSE EXPECTATIONS and ASSIGNMENTS

**Class Attendances and Participation.** Students are expected to meet posted deadlines, participate in class threaded discussions and complete required readings.

1. **STEM concept map.**
   - .1 What I know at the beginning of this course
   - .2 What I know at the end of this course
2. **STEM experience essay.** Each of us has had experience with science, technology, mathematics and, engineering. In this first essay, you will write about your experience with those disciplines, regardless if they were integrated or not. At the end of the course, you again complete an essay, revisiting your first essay and feedback received on the first essay.
3. **Threaded Discussions:** You will be asked to post on the four following topics. Each post will be expected after the completion of the week’s reading(s). You will be expected to respond to at least two other posts using the prompts given.
   - .1 Role of Engineers in Past Societies
   - .2 Displaying a Web of Connections
   - .3 Scientific and Technical Literacy as Cultural Capital
   - .4 Using Technology to Understand Content
4. **Changing views of technology.** Technology has changed over time and people’s views of technology has changed due to both societal and technological events.
5. **Critical issue in STEM.** Identify one or more issues associated with the STEM field and write a 3 page analysis of the issue.
7. **Learning to Code.** In this assignment, you complete one of the hour of code programs and reflect on your actions as a coder and think about how coding could be used in your classroom as a model of problem solving.

**Specific Assignment Descriptions**

1. **STEM Concept Map:** This assignment has two parts, the first is to be completed and posted to eCampus during the second week of class. The second part is to be posted during the last week of class and will be accompanied by writing. First part of the assignment is to construct a concept map illustrating your understanding of STEM. The second part will be, at the end of the course, to construct another concept map of STEM and a reflection (no more than two pages, double spaced) reporting how your vision of STEM changed over the semester.

2. **Experience with STEM:** In this short essay (2 pages maximum), write about your experiences with STEM, as you understand STEM at the beginning of the course.
3. **Threaded Discussions:** There will be 4 threaded discussion postings. Each will be followed by two or more, substantive, responses to others' postings. Substantive means to go beyond like/agree/disagree types of postings.

4. **Changing view of Technology:** People’s views of technology has changed over time, and continues to change. In this written assignment (3-4 pages in length), you should explore views on technology, first explaining why particular views were held, and then write about how those views might have changed and what the precipitating social/technological/scientific event(s) that caused the change (seldom is there one precipitating event so think about an accumulation of evidence). This paper should be referenced - title page and reference page do not count toward 3-4 page count.

5. **Critical Issue in STEM:** Identify one or more issues that surround or are embedded in the idea of STEM as implemented in US society/schools today. First present the issue, explaining what it is and then explain why addressing this issue is important to schools and society. This referenced writing should be at least 3 pages long, not counting references.

6. **Book/Article Report.** Select one scholarly book or scholarly article from resources you have found on STEM and write a 3-page report. Justify the selection and assess the article/book’s value and impact.

   Start your paper, after putting your name as the running head, with a complete APA style citation of the book. Then write your report - three parts should be included:
   
   1. Why you chose this book or why it was recommended to you.
   2. What is the value of this book to the field and you as a scholar of STEM.
   3. What has been the impact of the book in your field.

   This assignment is three (3) pages in length, double spaced, Times Roman 12 pt, with 1” margins. Every line over 3 pages is a reduction in base grade of 1 point - write, read, edit, reread, re-edit.

   You should post your book/article review to eCampus no later than the 12th week of class.

7. **Hour of Code:** In this assignment, you complete one of the hour of code programs and reflect on your actions as a coder and think about how coding could be used in your classroom as a model of problem solving. You may want to keep a log of your coding activity as you do it rather than trying to reflect on the activity after you have completed the process. Write a 2-3 page paper on how you could use this in your teaching to engage students (many of the programs encourage students to build games) and teach critical thinking skills. Post the paper and a copy of your hour of code certificate on eCampus.

8. **Reference Database.** Begin a reference database using a standard system. Using either RefWorks (available through the Evans Library) or EndNotes (available from https://software.tamu.edu/public/AvailableSoftware.aspx), begin preparing a bibliography of reference materials (articles and books, etc.) that are either of interest to you or you could use in writing a paper for this course and/or another course. This could be where you put your reference for the handbook in your research area and you book for the book report assignment.

   * All written assignments will follow APA (2008) 6th edition guidelines. Students will be introduced to the APA manual during the first class,
http://isites.harvard.edu/apa_exposed and will be responsible throughout the semester for following APA guidelines in their written work.

An additional resource to use for APA format is the Purdue University Online Writing Lab (OWL) https://owl.english.purdue.edu/owl/section/2/10/

Attendance

The University views class attendance as the responsibility of an individual student. Attendance is essential to complete the course successfully. University rules related to excused and unexcused absences are located on-line at http://student-rules.tamu.edu/rule07. In this course, attendance refers to attending to assignments as given and completion of assignments by due date.

I understand you are professionals and have life outside of your doctoral program. If you have to miss class, please let me know in advance and submit your assignment before the class meeting.

* Late assignments will be accepted up to a week late within terms of university attendance rules. They will have 10% of the points for the assignment deducted.

**This course abides by all Texas A&M University rules for attendance. More than two unexcused absences will result in the final grade being lowered one letter grade.

Students are expected to complete all assignments of the course by the end of the semester. A grade of Incomplete can be considered only if the student's situation conforms to Rule 10.5 of Student Rules http://student-rules.tamu.edu/rule10. According to rule 10.5, a student must initiate the request, in writing, for a grade of Incomplete, before the final day of the semester.

ASSIGNMENTS, GRADING SCALE, & DUE DATES

<table>
<thead>
<tr>
<th>#</th>
<th>ASSIGNMENTS</th>
<th>Points</th>
<th>Percentage</th>
<th>DUE DATES</th>
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<tbody>
<tr>
<td></td>
<td>Class Attendance, Participation</td>
<td>20</td>
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<tr>
<td>1</td>
<td>STEM Concept Map</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>1.1</td>
<td>15</td>
<td>6%</td>
<td>Week 2</td>
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<tr>
<td></td>
<td>1.2 and paper</td>
<td>30</td>
<td>12%</td>
<td>Week 2</td>
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<td>2</td>
<td>STEM experience essay</td>
<td>20</td>
<td>8%</td>
<td>Week 2</td>
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<tr>
<td>3</td>
<td>Threaded discussions - 10 pts ea</td>
<td>40</td>
<td>16%</td>
<td>As indicated on eCampus</td>
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<td>3.1 Role of Engineers</td>
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<td>3.2 Connections of STEM Parts</td>
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<td></td>
<td>3.2 Cultural Capital</td>
<td></td>
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<td>3.4 Understanding Content</td>
<td></td>
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<td>4</td>
<td>Changing view of Technology</td>
<td>20</td>
<td>8%</td>
<td>Week 6</td>
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<tr>
<td>5</td>
<td>Critical Issues Research paper</td>
<td>30</td>
<td>12%</td>
<td>Week 9</td>
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<td>6</td>
<td>Book Report - paper</td>
<td>20</td>
<td>8%</td>
<td>Week 12</td>
</tr>
<tr>
<td>7</td>
<td>Learning to Code</td>
<td>20</td>
<td>8%</td>
<td>Week 10</td>
</tr>
<tr>
<td>8</td>
<td>Reference Database</td>
<td>30</td>
<td>12%</td>
<td>Week 13</td>
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<td>Total % Grade</td>
<td>245 pts.</td>
<td>~100%</td>
<td>90 - 100% = A</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>80 - 89.99% = B</td>
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<td>70 - 79.99% = C</td>
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<td>Week Number</td>
<td>Topic/ Reading Assignment</td>
<td>Homework due this week, number refers to assignment number</td>
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<tr>
<td>One</td>
<td>Introductions</td>
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<td>Two</td>
<td>STEM as a concept</td>
<td>Blackley, S., &amp; Howell, J. (2015)</td>
<td></td>
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<tr>
<td>Three</td>
<td>Role of ancient Engineers in Society</td>
<td>Sprague de Camp, L. (1993). Ch 1; Petroski reading, pp vii - 42.</td>
<td>3.1 Threaded Discussion Topic: Role of Engineers in Society</td>
<td></td>
</tr>
<tr>
<td>Four</td>
<td>Connections - how engineering, math and science work for societal change</td>
<td>View James Burke video <a href="https://www.youtube.com/watch?v=DEPKGsk26vU">https://www.youtube.com/watch?v=DEPKGsk26vU</a></td>
<td>3.2 Threaded Discussion Topic: Displaying the Web of Connections</td>
<td></td>
</tr>
<tr>
<td>Five</td>
<td>Technology in the West</td>
<td>Pp 1-22; 235-250 in Reynolds &amp; Cutliffe; Merton, R. (1938).</td>
<td>8.1 Establishment of Reference Database</td>
<td></td>
</tr>
<tr>
<td>Six</td>
<td>Technology in America</td>
<td>Cowan, Chs 3 &amp; 9; Marvin, Ch 1</td>
<td>4.0 Essay - different views on technology over time.</td>
<td></td>
</tr>
<tr>
<td>Seven</td>
<td>Science, Technology and Society</td>
<td>Kumar, &amp; Chubin</td>
<td>3.3 Threaded Discussion Topic: Scientific and Technological Literacy as Cultural Capital</td>
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<tr>
<td>Nine</td>
<td>Role of the Scientist</td>
<td>Elves, M. W. &amp; Gibson, I. (Nov 4, 2013)</td>
<td>5.0 Critical Issue in STEM Essay</td>
<td></td>
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<tr>
<td>Ten</td>
<td>Coding as Problem solving</td>
<td>Hour of Code</td>
<td>7.0 Hour of Code Certificate; Reflection paper on Coding</td>
<td></td>
</tr>
<tr>
<td>Eleven</td>
<td>Technological Pedagogical Content Knowledge</td>
<td>Niess, M. L. (2005); Slough (2016)</td>
<td>3.4 Threaded Discussion Topic: Using Technology to Understand Content</td>
<td></td>
</tr>
<tr>
<td>Twelve</td>
<td>Educating for STEM careers</td>
<td>Murphy and Mancini-Samuelson.</td>
<td>6.1 Book/Article Report</td>
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<tr>
<td>Thirteen</td>
<td>STEM as an academic endeavor</td>
<td>Burke, Fire From the Sky, <a href="https://www.youtube.com/watch?v=un4nJRpvye">https://www.youtube.com/watch?v=un4nJRpvye</a>; read Subramaniam, Ahn, Fleischmann, &amp; Druin</td>
<td>8.2 Completed Reference Database of STEM articles; 6.2 Review of Book/Article Report</td>
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<td>Fourteen</td>
<td>Final Thoughts</td>
<td>1.2: Map of STEM - reflective analysis; 2.2: Reflection on Past Experience with STEM</td>
<td></td>
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</table>
TAMU and TLAC Departmental Statements

Americans with Disabilities Act
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit http://disability.tamu.edu.

AGGIE HONOR CODE
"An Aggie does not lie, cheat, or steal or tolerate those who do."

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System.

For additional information please visit: http://aggiehonor.tamu.edu.

Copyright and Plagiarism Policy
The materials used in this course are copyrighted. These materials include but are not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless permission is expressly granted.

As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated.

If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, student-rules.tamu.edu, under the section “Scholastic Dishonesty.”

The Department of Teaching, Learning and Culture (TLAC) does not tolerate discrimination, violence, or vandalism. TLAC is an open and affirming department for all people, including those who are subjected to racial profiling, hate crimes, heterosexism, and violence, and vandalism. Texas A&M University is an Affirmative Action and Equal Opportunity institution and affirms its dedication to non-discrimination on the basis of race, color, religion, gender, age, sexual orientation, domestic partner status, national origin, or disability in employment, programs, and services. Our commitment to non-discrimination and affirmative action embraces the entire university community including faculty, staff, and students.

TAMU On-Line Class Evaluation web address is: https:pica.tamu.edu.
BIBLIOGRAPHY

Bayer Corporation. (June 2012). "Bayer Facts of Science Education XV: A View from the Gatekeepers—STEM Department Chairs at America's Top 200 Research Universities on Female and Underrepresented Minority Undergraduate STEM." Journal of Science Education and Technology, Vol. 21, No. 3, pp. 317-324


Burke, J. Connections², Episode 7 Photo Finish, retrieve from https://www.youtube.com/watch?v=DEPKGsk26vU

Burke, J. Connections³, Episode 3 Drop the Apple, https://www.youtube.com/watch?v=nZJ9VdX4ewM&list=PL-teo99ENSypJDyeXmEpLOxWMB9UVPbOS&index=21

Burke, J. Connections³, Episode 8 Fire From the Sky, retrieve from https://www.youtube.com/watch?v=un4nJRpyhek

Code.org Retrieved from https://code.org/about.


DEPARTMENT OF TEACHING, LEARNING AND CULTURE
TEXAS A&M UNIVERSITY
COURSE SYLLABUS

EDCI 726: History and Trends in STEM Education
SECTION: 700
TERM: Summer 2018
SCHEDULE: Course is taught on-line
CREDIT: 3 SEMESTER HOURS
PROFESSOR: Dr. Lynn M. Burlbaw
330 Harrington Tower
CONTACT Phone: 979-845-8384
INFORMATION: email: burlbaw@tamu.edu
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PREREQUISITE
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1. Understand the place of science, engineering, mathematics and technology in society from a historical perspective.

2. Develop an understanding of concepts associated with STEM education; explain models, both published and personal, and how they change over time.

3. Develop and understanding of the role and responsibility of scientists, mathematicians, and engineers in society.

4. Identify and critique current practices of STEM education in K-12 schools and higher education.
5. Develop facility with coding as a means of problem solving and application to classroom activities.

6. Learn how to find published materials using a variety of databases that inform understanding of issues related to STEM education. Access and download reference citations using electronic database software (e.g., RefWorks, EndNotes, Zotero, etc.). Begin the process of creating an electronic database of articles related to STEM.

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   - 1. What I know at the beginning of this course
   - 2. What I know at the end of this course

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3. **Threaded Discussions:** You will be asked to post on the four following topics. Each post will be expected after the completion of the week's reading(s). You will be expected to respond to at least two other posts using the prompts given.
   - 1. Role of Engineers in Past Societies
   - 2. Displaying a Web of Connections
   - 3. Scientific and Technical Literacy as Cultural Capital
   - 4. Using Technology to Understand Content

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5. **Critical issue in STEM.** Identify one or more issues associated with the STEM field and write a 3-page analysis of the issue.


7. **Learning to Code.** In this assignment, you complete one of the hour of code programs and reflect on your actions as a coder and think about how coding could be used in your classroom as a model of problem solving.


### Specific Assignment Descriptions

**1. STEM Concept Map:** This assignment has two parts, the first is to be completed and posted to eCampus during the second week of class. The second part is to be posted during the last week of class and will be accompanied by writing. First part of the assignment is to construct a concept map illustrating your understanding of STEM. The second part will be, at the end of the course, to construct another concept map of STEM and a reflection (no more than two pages, double spaced) reporting how your vision of STEM changed over the semester.

**2. Experience with STEM:** In this short essay (2 pages maximum), write about your experiences with STEM, as you understand STEM at the beginning of the course.
3. **Threaded Discussions**: There will be 4 threaded discussion postings. Each will be followed by two or more, substantive, responses to others' postings. Substantive means to go beyond like/agree/disagree types of postings.

4. **Changing view of Technology**: People’s views of technology has changed over time, and continues to change. In this written assignment (3-4 pages in length), you should explore views on technology, first explaining why particular views were held, and then write about how those views might have changed and what the precipitating social/technological/scientific event(s) that caused the change (seldom is there one precipitating event so think about an accumulation of evidence). This paper should be referenced - title page and reference page do not count toward 3-4 page count.

5. **Critical Issue in STEM**: Identify one or more issues that surround or are embedded in the idea of STEM as implemented in US society/schools today. First present the issue, explaining what it is and then explain why addressing this issue is important to schools and society. This referenced writing should be at least 3 pages long, not counting references.

6. **Book/Article Report**: Select one scholarly book or scholarly article from resources you have found on STEM and write a 3-page report. Justify the selection and assess the article/book’s value and impact.

   Start your paper, after putting your name as the running head, with a complete APA style citation of the book. Then write your report - three parts should be included:
   1. Why you chose this book or why it was recommended to you.
   2. What is the value of this book to the field and you as a scholar of STEM.
   3. What has been the impact of the book in your field.

   This assignment is three (3) pages in length, double spaced, Times Roman 12 pt, with 1” margins. Every line over 3 pages is a reduction in base grade of 1 point - write, read, edit, reread, re-edit.

   You should post your book/article review to eCampus no later than the 12th week of class.

7. **Hour of Code**: In this assignment, you complete one of the hour of code programs and reflect on your actions as a coder and think about how coding could be used in your classroom as a model of problem solving. You may want to keep a log of your coding activity as you do it rather than trying to reflect on the activity after you have completed the process. Write a 2-3 page paper on how you could use this in your teaching to engage students (many of the programs encourage students to build games) and teach critical thinking skills. Post the paper and a copy of your hour of code certificate on eCampus.

8. **Reference Database**: Begin a reference database using a standard system. Using either RefWorks (available through the Evans Library) or EndNotes (available from https://software.tamu.edu/public/AvailableSoftware.aspx ), begin preparing a bibliography of reference materials (articles and books, etc.) that are either of interest to you or you could use in writing a paper for this course and/or another course. This could be where you put your reference for the handbook in your research area and you book for the book report assignment.

* All written assignments will follow APA (2008) 6th edition guidelines. Students will be introduced to the APA manual during the first class,
http://isites.harvard.edu/apa_exposed and will be responsible throughout the semester for following APA guidelines in their written work.

An additional resource to use for APA format is the Purdue University Online Writing Lab (OWL) https://owl.english.purdue.edu/owl/section/2/10/

Attendance

The University views class attendance as the responsibility of an individual student. Attendance is essential to complete the course successfully. University rules related to excused and unexcused absences are located on-line at http://student-rules.tamu.edu/rule07. In this course, attendance refers to attending to assignments as given and completion of assignments by due date.

I understand you are professionals and have life outside of your doctoral program. If you have to miss class, please let me know in advance and submit your assignment before the class meeting.

*Late assignments will be accepted up to a week late within terms of university attendance rules. They will have 10% of the points for the assignment deducted.

**This course abides by all Texas A&M University rules for attendance. More than two unexcused absences will result in the final grade being lowered one letter grade. Students are expected to complete all assignments of the course by the end of the semester. A grade of Incomplete can be considered only if the student's situation conforms to Rule 10.5 of Student Rules. http://student-rules.tamu.edu/rule10 According to rule 10.5, a student must initiate the request, in writing, for a grade of Incomplete, before the final day of the semester.

ASSIGNMENTS, GRADING SCALE, & DUE DATES

<table>
<thead>
<tr>
<th>#</th>
<th>ASSIGNMENTS</th>
<th>Points</th>
<th>Percentage</th>
<th>DUE DATES</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Class Attendance, Participation</td>
<td>20</td>
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<tr>
<td>1.1</td>
<td>STEM Concept Map</td>
<td>15</td>
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<td>Week 2</td>
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<td>1.2 and paper</td>
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<td>Week 14</td>
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<td>2</td>
<td>STEM experience essay</td>
<td>20</td>
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<td>Week 2</td>
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<tr>
<td>3</td>
<td>Threaded discussions - 10 pts ea</td>
<td>40</td>
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<td>As indicated on eCampus</td>
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<td>3.1</td>
<td>Role of Engineers</td>
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<td>3.2</td>
<td>Connections of STEM Parts</td>
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<td>3.2</td>
<td>Cultural Capital</td>
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<td>3.4</td>
<td>Understanding Content</td>
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<td>4</td>
<td>Changing view of Technology</td>
<td>20</td>
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<td>Week 6</td>
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<td>5</td>
<td>Critical Issues Research paper</td>
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<td>Week 9</td>
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<td>6</td>
<td>Book Report - paper</td>
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<td>Week 12</td>
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<td>7</td>
<td>Learning to Code</td>
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<td>Week 10</td>
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<td>8</td>
<td>Reference Database</td>
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<td>12%</td>
<td>Week 13</td>
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<td>Total % Grade</td>
<td>245 pts.</td>
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<td>90 - 100% = A &lt;br&gt; 80 - 89.99% = B &lt;br&gt; 70 - 79.99% = C &lt;br&gt; 60 - 69.99% = D &lt;br&gt; &lt;60 = F</td>
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<td>Topic/Reading Assignment</td>
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<td>One</td>
<td>Introductions</td>
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<td>STEM as a concept</td>
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<td>Three</td>
<td>Role of ancient Engineers in Society</td>
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<td>Four</td>
<td>Connections - how engineering, math and science work for societal change</td>
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<td>Five</td>
<td>Technology in the West</td>
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<td>Six</td>
<td>Technology in America</td>
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<td>Seven</td>
<td>Science, Technology and Society</td>
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<td>Eight</td>
<td>Ethics and Engineering</td>
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<td>Role of the Scientist</td>
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<td>Ten</td>
<td>Coding as Problem solving</td>
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<td>Eleven</td>
<td>Technological Pedagogical Content Knowledge</td>
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<td>Twelve</td>
<td>Educating for STEM careers</td>
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<td>Thirteen</td>
<td>STEM as an academic endeavor</td>
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<td>Fourteen</td>
<td>Final Thoughts</td>
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<thead>
<tr>
<th>Reading Assignment</th>
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<tbody>
<tr>
<td>Blackley, S., &amp; Howell, J. (2015) 1.1 ; Map of STEM; 2.1: Essay on Experience with STEM</td>
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<tr>
<td>Sprague de Camp, L. (1993). Ch 1; Petroski reading, pp vii - 42. 3.1 Threaded Discussion Topic: Role of Engineers in Society</td>
</tr>
<tr>
<td>View James Burke video <a href="https://www.youtube.com/watch?v=DEPKGs26vU">https://www.youtube.com/watch?v=DEPKGs26vU</a> 3.2 Threaded Discussion Topic: Displaying the Web of Connections</td>
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<td>Pp 1-22; 235-250 in Reynolds &amp; Cutliffe; Merton, R. (1938). 8.1 Establishment of Reference Database</td>
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<td>Cowan, Chs 3 &amp; 9; Marvin, Ch 1 4.0 Essay - different views on technology over time.</td>
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<td>Kumar, &amp; Chubin 3.3 Threaded Discussion Topic: Scientific and Technological Literacy as Cultural Capital</td>
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<tr>
<td>Elves, M. W. &amp; Gibson, I. (Nov 4, 2013) 5.0 Critical Issue in STEM Essay</td>
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<td>Hour of Code 7.0 Hour of Code Certificate; Reflection paper on Coding</td>
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<tr>
<td>Niess, M. L. (2005); Slough (2016) 3.4 Threaded Discussion Topic: Using Technology to Understand Content</td>
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<tr>
<td>Murphy and Mancini-Samuelson. 6.1 Book/Article Report</td>
</tr>
<tr>
<td>Burke, Fire From the Sky, <a href="https://www.youtube.com/watch?v=un4nJRpyvek">https://www.youtube.com/watch?v=un4nJRpyvek</a>; read Subramaniam, Ahn, Fleischmann, &amp; Druin 8.2 Completed Reference Database of STEM articles 6.2 Review of Book/Article Report</td>
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<tr>
<td>1.2: Map of STEM - reflective analysis; 2.2: Reflection on Past Experience with STEM</td>
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TAMU and TLAC Departmental Statements

Americans with Disabilities Act
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit http://disability.tamu.edu.

AGGIE HONOR CODE
"An Aggie does not lie, cheat, or steal or tolerate those who do."

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System.

For additional information please visit: http://aggiehonor.tamu.edu.

Copyright and Plagiarism Policy
The materials used in this course are copyrighted. These materials include but are not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless permission is expressly granted.

As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated.

If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, student-rules.tamu.edu, under the section “Scholastic Dishonesty.”

The Department of Teaching, Learning and Culture (TLAC) does not tolerate discrimination, violence, or vandalism. TLAC is an open and affirming department for all people, including those who are subjected to racial profiling, hate crimes, heterosexism, and violence, and vandalism. Texas A&M University is an Affirmative Action and Equal Opportunity institution and affirms its dedication to non-discrimination on the basis of race, color, religion, gender, age, sexual orientation, domestic partner status, national origin, or disability in employment, programs, and services. Our commitment to non-discrimination and affirmative action embraces the entire university community including faculty, staff, and students.

TAMU On-Line Class Evaluation web address is: https:pica.tamu.edu.
BIBLIOGRAPHY

Bayer Corporation. (June 2012). "Bayer Facts of Science Education XV: A View from the Gatekeepers—STEM Department Chairs at America's Top 200 Research Universities on Female and Underrepresented Minority Undergraduate STEM." Journal of Science Education and Technology, Vol. 21, No. 3, pp. 317-324

http://dx.doi.org/10.14221/ajte.2015v40n7.8

Burke, J. Connections², Episode 7 Photo Finish, retrieve from https://www.youtube.com/watch?v=DEPKGsk26vU

Burke, J. Connections³, Episode 3 Drop the Apple, https://www.youtube.com/watch?v=nZJ9VdX4ewM&list=PL-teo99ENSypJDyeXmEpLOxWMB9UVpOS&index=21

Burke, J. Connections³, Episode 8 Fire From the Sky, retrieve from https://www.youtube.com/watch?v=un4nJRpyek

Code.org Retrieved from https://code.org/about.


