# ETEC 568 Maker Spaces:

# A Movement in Educational Technology

COURSE SYLLABUS: FALL 2026
Course Dates: Oct. 19 – Dec. 11

## INSTRUCTOR INFORMATION

**Instructor:** Chris Bigenho, PhD
**Office Location:** Virtual
**Office Hours:** Virtual by Appointment
**Office Phone:** 214-232-9504
**University Email Address:** chris.bigenho@etamu.edu
**Preferred Form of Communication:** University email
**Communication Response Time:** 24 hours (Monday – Friday)

## COURSE INFORMATION

### Materials – Textbooks, Readings, Supplementary Readings

**NOTICE:** This syllabus may be adjusted as needed to provide the best possible learning opportunity for all students in the class.

**Materials – Textbooks, Readings, Supplementary Readings**:

**Arduino Starter Kit [REQUIRED]**
You will need to purchase the Arduino Uno Ultimate Starter Kit. This can be purchased from Amazon and other online retailers. I have provided a link to a couple of sources for this item. It is important that you have this kit in hand prior to the start of class. It is approximately $60 to $90. Any of the following kits will work. (Next Page)

Sources for Arduino Starter Kits

Amazon: http://tinyurl.com/amazon-arduino
Arduino Store: https://store-usa.arduino.cc/collections/kits/products/arduino-starter-kit-multi-language

These Starter Kits will also work and provide additional options

Option 1: https://tinyurl.com/ArduinoOption1
Option 2: https://tinyurl.com/ArduinoOption2

**Arduino programming IDE 2.x.x (Latest version- 2.3.6)**
You will download and install this free program during the first week of your class. If you want to do that before class starts, download Arduino latest version for your OS: https://www.arduino.cc/en/Main/Software.

**Textbook:**
All texts and readings will be provided electronically through the learning management system and the library.

## Course Description

**Course Description:** This course will explore the emerging maker movement on several levels. Through reading and research, you will begin to understand the culture and structure of the maker movement and how it can be implemented in existing schools. You will also have a chance to participate in several aspects of making through prototyping with electronics, microcontrollers and some simple computer programming in C++ on the Arduino. This class is designed to serve as in introduction with the hope that you may be motivated to explore this exciting field more on your own.

**Student Learning Outcomes:**
Learning outcomes are what you are able to do as a result of the activities, readings, instruction, etc. that have occurred in this course. Assignments/activities related to these outcomes are described in the assignments and assessments portion of the syllabus.

The learner will:

1. Understand the driving forces behind the maker movement and the characteristics of a “maker” with the goal of connecting making with your current practices
2. Participate in making through the development of small projects using the Arduino microcontroller, basic electronics and C++ for the Arduino.
3. Maintain a blog that can be used to share their stories of making- both successes and lessons learned from failures certain to occur.

The *syllabus/schedule are subject to change.*

4. Review literature on the theory behind problem-based learning and the maker movement, maker space designs and implementations.

## COURSE REQUIREMENTS

## Instructional Methods

Each week will have a series of readings, learning adventures and interactions. This course is designed to help you understand the emerging world of making in education and to provide you the opportunity to actually engage in aspects of making in the world of computer science. One of the major tenants of the maker movement is to share with the broader community your stories of success and lessons learned from failures. In short, the maker movement is largely a collaborative group of learners engaged in the process of making new and interesting things to solve real problems. Therefore, i**t is important that you reach out to your fellow classmates as your first source of help**. We tend to learn more in groups than we do individually. Please use the discussion boards for posting questions and supporting the learning of others by providing tips on what you have learned as you explore the world of making. This will be particularly important as you engage in the actual process of prototyping and programming with the Arduino Microcontrollers. We are all coming to this class with a range of skills and experiences and we must learn to leverage the expertise of the group.

**ETEC ePORTFOLIO for MS/MEd in Educational Technology**

Students pursuing the MS/MEd degree in Educational Technology Leadership (ETLD) program are now required to submit an electronic portfolio prior to graduation. Students pursuing the MS/MEd degree in Educational Technology Library Science (ETLS) are strongly encouraged to develop an eportfolio of their work throughout the program as it will benefit the student in obtaining a position in Library or Media Services, and it may become a program requirement in the near future. This requirement does not pertain to students taking ETEC courses as an elective for other programs, including those pursuing only the School Library Certification who have already earned a masters degree.

Many courses in the ETEC program have identified artifact(s) that should be included in the eportfolio to provide evidence of acquired and developing knowledge, skills, and philosophical approaches. In courses where recommended artifacts are not identified, it is the student's responsibility to collect artifacts throughout the course and appropriately select which artifacts to include in the eportfolio. This includes courses from other departments and/or institutions for which the student is receiving credit towards the ETEC masters degree. For example, if a student takes courses in ELED, EDAD, MGMT, or TDEV and applies credits earned toward their ETEC masters degree, the student should include artifacts from those courses in their ETEC eportfolio.

For **ETEC 568 Maker Spaces: A New Movement in Educational Technology**, you will complete several projects that you may decide to include in your program portfolio. As you look at your program portfolio, try to include artifacts that represent all aspects of

your journey and one from each class. I would be happy to recommend projects from this class that you may want to include as you make your way through the course.

If you plan to major in the program, but have not yet applied, you are strongly encouraged to do so as soon as possible. Please contact MaryJo.Dondlinger@tamu-commerce.edu for more information about the program's portfolio requirement.

## Student Responsibilities or Tips for Success in the Course

*Timeliness*

Because a 7-week term goes by quickly--assignments must be submitted by the designated due dates. Full credit cannot be earned by late or incomplete assignments. Assignments may lose up to 10% of their possible value each day late if submitted after the posted due date/time. (e.g. Assignments can lose all of their value at 10 days past due.) When a project incorporates peer review, it is imperative that all projects be available at the beginning of the review period and that reviews are completed by the end of the review period so that others may incorporate feedback into project revisions. Late work that requires peer review may lose all review points if review period has passed. When you are late with peer review work, you inconvenience your peers.

Neglecting to provide meaningful feedback to peers and/or failing to make an assignment available for peer review will ***each*** result in 10% reduction in value (20% for both). You will have plenty of notification and time to complete course assignments. If you know you are going to be out of town, involved in a special event/project, or unable to access a computer, please plan ahead. Also ensure that you have a backup plan ready in the event you might lose power, Internet access, or your available technology.

*Time Commitment*

In a graduate level course, it is a reasonable and accepted expectation that a student will spend between three and four hours outside of class for each hour spent in a class that lasts 15 weeks. This applies to online and web-enhanced courses just as it does to a traditional course. The activities in this course are based on an 8-week instruction schedule, which cuts the number of weeks in half, thereby tripling the weekly time expectation. An understanding of this expectation can help serve as a gauge of how much time you will need to allow for and devote to each course. The average time commitment range calculation for a three Semester Credit Hour (3 SCH) course, such as this one, is show in the following table:

| Average expected time spent on class or class related work. | Minimum expected average time based on 3:1 time ratio. | Maximum expected average time based on 4:1 time ratio. |
|---|---|---|
| “In” class per class week | 5 hours | 5 hours |
| “Outside” class per class week | 15 hours | 20 hours |
| **TOTAL Weekly Expectation** | **20 hours** | **25 hours** |
| **TOTAL Term Expectation** | **140 hours** | **175 hours** |

## GRADING

Final grades in this course will be based on the following scale:

A = 90%-100%
B = 80%-89%
C = 70%-79%
D = 60%-69%
F = 59% or Below

Grades will be weighted as follows

- 20% **Participation**- Discussions, peer support, attendance/presence in the course
- 40% **Learning Adventures** where you are engaged in making through prototyping, programming and other experiences. This includes the documentation of your journey through your blog for this class
- 40% **Design/Proposal** document for the development of a maker space and implementation of a maker program at your school or within a school district where you are interested in working.

Grade Calculation:

Final Grade = (Participation grade x 0.2)+(Learning Adventures grade x 0.4)+(Design Proposal grade x .04)

## TECHNOLOGY REQUIREMENTS

### Browser support

D2L is committed to performing key application testing when new browser versions are released. New and updated functionality is also tested against the latest version of supported browsers. However, due to the frequency of some browser releases, D2L cannot guarantee that each browser version will perform as expected. If you encounter

any issues with any of the browser versions listed in the tables below, contact D2L Support, who will determine the best course of action for resolution. Reported issues are prioritized by supported browsers and then maintenance browsers.

Supported browsers are the latest or most recent browser versions that are tested against new versions of D2L products. Customers can report problems and receive support for issues. For an optimal experience, D2L recommends using supported browsers with D2L products.

Maintenance browsers are older browser versions that are not tested extensively against new versions of D2L products. Customers can still report problems and receive support for critical issues; however, D2L does not guarantee all issues will be addressed. A maintenance browser becomes officially unsupported after one year.

Note the following:

- Ensure that your browser has JavaScript and Cookies enabled.
- For desktop systems, you must have Adobe Flash Player 10.1 or greater.
- The Brightspace Support features are now optimized for production environments when using the Google Chrome browser, Apple Safari browser, Microsoft Edge browser, Microsoft Internet Explorer browser, and Mozilla Firefox browsers.

**Desktop Support**

| Browser | Supported Browser Version(s) | Maintenance Browser Version(s) |
|---|---|---|
| Microsoft® Edge | Latest | N/A |
| Microsoft® Internet Explorer® | N/A | 11 |
| Mozilla® Firefox® | Latest, ESR | N/A |
| Google® Chrome™ | Latest | N/A |
| Apple® Safari® | Latest | N/A |

## Tablet and Mobile Support

| Device | Operating System | Browser | Supported Browser Version(s) |
|---|---|---|---|
| Android™ | Android 4.4+ | Chrome | Latest |
| Apple | iOS® | Safari, Chrome | The current major version of iOS (the latest minor or **point** release of that major version) and the previous major version of iOS (the latest minor or **point** release of that major version). For example, as of June 7, 2017, D2Lsupports iOS 10.3.2 and iOS 9.3.5, but not iOS 10.2.1, 9.0.2, or any other version.<br>Chrome: Latest version for the iOS browser. |
| Windows | Windows 10 | Edge, Chrome, Firefox | Latest of all browsers, and Firefox ESR. |

- You will need regular access to a computer with a broadband Internet connection. The minimum computer requirements are:
    - 512 MB of RAM, 1 GB or more preferred
    - Broadband connection required courses are heavily video intensive
    - Video display capable of high-color 16-bit display 1024 x 768 or higher resolution

- You must have a:
    - Sound card, which is usually integrated into your desktop or laptop computer
    - Speakers or headphones.
    - *For courses utilizing video-conferencing tools and/or an online proctoring solution, a webcam and microphone are required.

- Both versions of Java (32 bit and 64 bit) must be installed and up to date on your machine. At a minimum Java 7, update 51, is required to support the learning management system. The most current version of Java can be downloaded at: JAVA web site http://www.java.com/en/download/manual.jsp

- Current anti-virus software must be installed and kept up to date.

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Running the browser check will ensure your internet browser is supported.

Pop-ups are allowed.
JavaScript is enabled.
Cookies are enabled.

- You will need some additional free software (plug-ins) for enhanced web browsing. Ensure that you download the free versions of the following software:
  - Adobe Reader https://get.adobe.com/reader/
  - Adobe Flash Player *(version 17 or later)* https://get.adobe.com/flashplayer/
  - Adobe Shockwave Player https://get.adobe.com/shockwave/
  - Apple Quick Time http://www.apple.com/quicktime/download/

- At a minimum, you must have Microsoft Office 2013, 2010, 2007 or Open Office. Microsoft Office is the standard office productivity software utilized by faculty, students, and staff. Microsoft Word is the standard word processing software, Microsoft Excel is the standard spreadsheet software, and Microsoft PowerPoint is the standard presentation software. Copying and pasting, along with attaching/uploading documents for assignment submission, will also be required. If you do not have Microsoft Office, you can check with the bookstore to see if they have any student copies.

## ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu**.**

**Note:** Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

## COMMUNICATION AND SUPPORT

### Brightspace Support

### Need Help?

### Student Support

If you have any questions or are having difficulties with the course material, please contact your Instructor.

The *syllabus/schedule are subject to change.*

### Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778 or click on the **Live Chat** or click on the words "click here" to submit an issue via email.

### System Maintenance

Please note that on the 4th Sunday of each month there will be System Maintenance which means the system will not be available 12 pm-6 am CST.

### Interaction with Instructor Statement

All instruction will take place in a distributed fashion through D2L Brightspace and Email. Most of the course will be asynchronous. However, you may be working in groups in which case you will need to coordinate schedules to facilitate group work. Additionally, there will be opportunities for synchronous work with Dr. Bigenho should it be needed. These sessions will be optional and are available to you through prior arrangements. These interactions will use Zoom which will be accessible through a link that Dr. Bigenho will provide.

You should use the course site for most communication. When using e-mail, use cbigenho.unt@gmail.com or bigenhochris@tamuc.edu. Monday through Friday, I will return email in 24 hours or less. That being said, it will usually be much less time.

## COURSE AND UNIVERSITY PROCEDURES/POLICIES

### Course Specific Procedures/Policies

It is important that you follow the directions of the course carefully as different assignments will require different tools for completion and different methods of submission. It is also important that you keep to the schedule as there are only 7 weeks to the class. Additionally, there may be times when you will need to work with others in the class. **Being late with your work WILL impact your grades negatively as it will also impact the ability of others to do their work. Bottom line, don't be late.**

**Discussions:** Discussions happen as they happen. Each week you are expected to participate in the discussions. These are NOT places for you to simply answer questions that I post. **I expect** to see a discussion- an exchange of ideas extended over time where there is evidence that you listened to others, reflected on material and offered new ideas/perspectives, provided help to your peers and posed your own questions to the group. There will be a discussion for each week. The only posts that will be considered for the discussion grade for that week MUST occur prior to the closing date of that week.

**Attendance and Engagement:** You need to check into the course on a daily basis (5 days out of 7). Since we will not have any face-to-face meetings, you must remain engaged in the course and with your peers through the myLeo Online (D2L Brightspace) learning environment. Engagement is often indicated by regular participation in the online discussions. Experience indicates that students who are not engaged regularly in the online environment generally have difficulties completing online courses successfully.

### Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

## University Specific Procedures

### Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook.
http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: Netiquette
http://www.albion.com/netiquette/corerules.html

### TAMUC Attendance

For more information about the attendance policy please visit the Attendance webpage and Procedure 13.99.99.R0.01.
http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf

### Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

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Graduate Student Academic Dishonesty 13.99.99.R0.10

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf

## ADA Statement

### Students with Disabilities

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 have a disability requiring an accommodation, please contact:

## Office of Student Disability Resources and Services

Texas A&M University-Commerce
Gee Library- Room 162
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: studentdisabilityservices@tamuc.edu

Website: Office of Student Disability Resources and Services

http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/

### Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

## Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

The *syllabus/schedule are subject to change.*

Web url:
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

### Counseling Center Statement

The Counseling Center at A&M-Commerce, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit www.tamuc/edu/counsel.

### Mental Health and Well-Being

The university aims to provide students with essential knowledge and tools to understand and support mental health. As part of our commitment to your well-being, we offer access to Telus Health, a service available 24/7/365 via chat, phone, or webinar. Scan the QR code to download the app and explore the resources available to you for guidance and support whenever you need it.

## COURSE OUTLINE / CALENDAR

Because this course runs on a compressed, 8-week schedule, we'll be completing the full-semester equivalent of 2 weeks of work each week. There is no time to catch up if you fall behind.

Each week will begin on a Monday and end on the following Sunday. Each week will be closed at the start of the class and the current week will open on Monday for that week's work.

The schedule of specific assignments will be listed in myLeo Online (D2L Brightspace) as they are scheduled. Each week's work is due at the end of that week unless otherwise noted.

**NOTICE:** This syllabus may be adjusted as needed to provide the best possible learning opportunity for all students in the class.