**AUBURN UNIVERSITY**

**SYLLABUS**

1. **Course Number:**CTSE 5000

**Course Title**:                 Technology and Applications in Science

**Credit Hours**:                2 Semester Hours

**Prerequisites**:               None

**Corequisites**:                 None

1. **Term:** Spring 2025

**Instructor**: Mr. Michael Moultrie

**Day/Time**: Tuesdays 6:00pm – 7:50pm

**Place**: EDUC 2114

**Contact Information**: [mdm0030@auburn.edu](mailto:mdm0030@auburn.edu)

**Preferred method of contact:** Email

Office Hours: By appointment. Email me, and we will set something up. I will be on campus Tuesdays and Wednesdays.

In case we need to have a Zoom meeting, meet me here:

<https://auburn.zoom.us/j/3152478231>

**3.   Texts:        None required. Readings will be provided through *Canvas*.**

This course will require the use of the learning management system, ***Canvas*** which can be accessed from the Auburn University website (www.auburn.edu). An orientation can be provided if requested.

**Computer requirement:** You need a laptop computer you can bring to class (Mac or PC) and install software on for use. Please see your instructor if you do not have a laptop computer that you can bring to class and install software on. iPads or tables *may* work, but then again, they may not work for all applications.

**4.  Course Description:**

This course serves as an introduction and application of current and emerging instruction and communication technologies for integration in the secondary science program.  It is an introduction to technology tools supporting inquiry, the Alabama Course of Study, the Next Generation Science Standards, and the National Science Education Standards in the secondary science classroom.

**5.  Course Objectives**

1. Facilitate and inspire student learning and creativity by providing a variety of learning environments that foster collaboration and innovative thinking to solve real world issues and authentic problems using digital tools and resources. 290-3-3-.42 (4)(b)1.
2. Design, develop, use, manage, and assess authentic digital-age learning experiences that are aligned with subject-area content and the Alabama Course of Study: Technology Education to maximize content learning and address diverse learning styles, incorporating the use of formative and summative measurement tools to better inform learning. 290-3-3-.42 (4)(b)2.
3. Model and facilitate innovative digital-age work and learning experiences through the effective use of current and emerging tools to ensure success in a global and digital world whereby the teacher and learner locate, analyze, evaluate, manage, and report information as well as communicate and collaborate online fluently using a variety of technology-based media formats. 290-3-3-.42 (4)(b)3.
4. Promote, model, and communicate the safe, legal and ethical principles of digital citizenship, equitable access, digital etiquette, and responsible online social interactions in a global culture including respect for copyright, intellectual property, the appropriate documentation of sources, and Internet user protection policies. 290-3-3-.42 (4)(b)4.
5. The role, nature, limitations, and use of media and technology for instruction and scientific investigation, including the use of virtual labs, computers, probeware, and other emerging technologies. 290-3-3-.14 (2)(e)2.(ii)
6. Engage in professional growth and leadership activities, including modeling lifelong learning by participating in face to face and online learning communities to continuously improve professional practice using existing and emerging digital tools, resources, and current research that focuses on improved student learning, as well as promotes professional development of other educators. 290-3-3-.42 (4)(b)5.
7. Include active inquiry lessons where students collect and interpret data in order to develop and communicate concepts and understand scientific processes, relationships and natural patterns from empirical experiences. Applications of science-specific technology are included in the lessons when appropriate. AS 2.2
8. Design instruction and assessment strategies that confront and address naïve concepts/preconceptions. AS 2.3
9. Use a variety of strategies that demonstrate the candidates’ knowledge and understanding of how to select the appropriate teaching and learning activities – including laboratory or field settings and applicable instruments and/or technology- to allow access so that all students learn. These strategies are inclusive and motivating for all students. AS 3.1
10. Develop lesson plans that include active inquiry lessons where students collect and interpret data using applicable science-specific technology in order to develop concepts, understand scientific processes, relationships and natural patterns from empirical experiences. These plans provide for equitable achievement of science literacy for all students. AS 3.2
11. Collect, organize, analyze, and reflect on diagnostic, formative and summative evidence of a change in mental functioning demonstrating that scientific knowledge is gained and/or corrected. AS 5.1

All students in this course are expected to have all the equipment and software needed to be successful in the course.

All students are expected to contribute to their own learning as active and well-prepared participants. Weekly modules will provide various opportunities for reading, reflection, applied experiences, collaboration, and writing. You should plan on spending the same amount of time outside of class working on technological tasks as you do in class.

**6.      Course Content Outline *(subject to change)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Class | Date | Module Due | In-Class Activities | Homework due that day at 6:00 |
| 1 | 8/19 | **1** | **Overview of Course**  **Inventory of skills.**  **Introductions.**  **How have you seen technology change in schools?**  **Syllabus**  **Canvas**  **Show how to use library to access NSTA articles**  **Presentation Tools**  [**Sway**](https://sway.com/)  **Google Tool**  **Assessment**  [**PollEverywhere**](https://www.polleverywhere.com/) | none |
| 2 | 8/26 | 2 | **Intro to design for 3D printing.**  Show how to use TinkerCAD  How to use 3D printer, Thingiverse  **Other Tools**  [TinkerCAD](https://www.tinkercad.com/)  **Google**  [Google Classroom](http://classroom.google.com/) | Make a presentation to introduce yourself. We will all look at these to study for the Name Quiz. Post URL on Canvas in Announcements. |
| 3 | 9/2 | 3 | **Observation and Inference**  [windy.com](http://windy.com/)  [Stellarium](http://stellarium.org/)  [ExploreLearning](http://www.explorelearning.com/)  [phet](http://phet.colorado.edu/en/simulations/browse)  [Animal cams](https://www.earthcam.com/events/animalcams/)  Name Quiz  **Google Tool**  Google Earth | Complete Google Units 1 and 2  Name Quiz |
| 4 | 9/9 | 4 | Lesson planning  Research on Simulations  Moon inquiry with Stellarium  Turn in your Moon inquiry | Read one NSTA article on technology and submit summary.  Complete Google Unit 3 |
| 5 | 9/16 | 5 | **Inquiry**  *Observation and Inference mini-lessons*  Show [ExploreLearning](https://www.explorelearning.com/)  and [PhET](https://phet.colorado.edu/) and teach a demo lesson. Have Ss grade me.  Show lesson plan examples. | Prepare for Observation and Inference mini-lesson.  Complete Google Unit 4 |
| 6 | 9/23 | 6 | **Flipping the Classroom**  **Google Tool**  Google Slides and Slido  Subscribe to YouTube Channels like Kurzgesagt  [NearPod](https://nearpod.com/)  [Paleobiology Database](https://paleobiodb.org/#/)  [Google Earth](https://www.google.com/earth/)  [Screencastify](https://www.screencastify.com/)  **Best practices for using PowerPoint**  Improving a PPT | Complete Google Unit 5  Submit name of simulation |
| 7 | 9/30 | 7 | **Google Tool**  Google Slides and Slido  [NearPod](https://nearpod.com/)  [Paleobiology Database](https://paleobiodb.org/#/)  [Google Earth](https://www.google.com/earth/)  [Screencastify](https://www.screencastify.com/) | Screencastify mini video due  Submit your Google Form URL  Complete Google Unit 6  Submit name of simulation |
| 8 | 10/7 | 8 | 3D printing Week (OPTIONAL ATTENDANCE) | Complete Google Unit 7 |
| Fall Break October 9th & 10th | | | | |
| 9 | 10/14 | 9 | **Assessment**  [Kahoot](https://kahoot.com/)  [Plickers](https://www.plickers.com/)  [Flipgrid](https://flipgrid.com/)  [ZipGrade](https://www.zipgrade.com/)  [Quizlet](https://quizlet.com/)  [Quizizz](https://quizizz.com/)  [Socrative](https://www.socrative.com/)  [Google Forms](https://docs.google.com/forms/u/0/)  [Screencastify](https://www.screencastify.com/) | Turn in simulation lesson plan.  Complete Google Unit 8 |
| 10 | 10/21 | 10 | [PhyPhox](https://phyphox.org/)  [Science Journal](https://www.arduino.cc/education/science-journal)  Do probe activity | Install Phyphox and Arduino Science Journal on your phones  Start sharing your Google Form  Draw to Design Due. |
| 11 | 10/28 | 11 | Little Robots & Scratch | Complete Google Units 9 & 10  First Print due. |
| 12 | 4/8 | 12 | **Google Tool**  Sheets  Flubaroo | Complete Google Units 11 and 12  Thingiverse Thing due. |
| 13 | 11/4 | 13 | ExploreLearning Lessons | Present Simulation Lesson |
| 14 | 11/11 | 14 | **Communication**  Show teacher portfolio examples  [Remind](https://www.remind.com/)  [Google Hangouts](https://hangouts.google.com/)  Science Education Videos | Design a Thing due  Complete Google Unit 13  Start Portfolio. Submit URL |
| 15 | 11/25 | 15 | Excel for gradebooks and test analysis  Analyze test data. | Consider doing Google Level 1 Certified Educator Test (Due before the end of the semester)  Turn in Excel data analysis |
| 16 | 12/2 | 16 | Submit Screencasted lesson and Teacher Portfolio and pass Google Exam. | Pass Google Level 1 Certified Educator Test.  Teacher Portfolio due.  Science Video due. |

**7. Additional Course Requirements for CTSE 6000 (Graduate Students in the MS or PhD or Traditional MEd)**

Graduate Students- Three research journal article reviews about educational technology:

30 points

8. **Grading**

**Undergrads**

Google Education Prep Assignments 5%

Professionalism/Participation /Attendance 10%

Class activities 25%

Home activities 30%

Science video 10%

Teacher portfolio 10%

Google Certification 10%

A = 90% or higher

B = 80% - 89%

C = 70% - 79%

D = 65% - 69%

F = below 65%

Any assignment presented or turned in late without a valid excuse will be penalized 5% for each day late. Late assignments presented or turned in late after two days (after 6pm Thursdays) will not be accepted without prior approval of the instructor. You may be given the opportunity for ONE re-do if the professor decides to offer that option.

AU eValuate Fall Semester evaluation:

Extra Credit added to one final exam item if evidence of completing AU eValuate for course is submitted (screenshot end of survey)

**8.   Class Policy Statements:**

A. Participation: Students are expected to participate in all class discussions and participate in all exercises.

B. Assignments: It is the student’s responsibility to contact the instructor if assignment deadlines are not met. Students are responsible for initiating arrangements for missed work, if extensions are given for very difficult situations. If work is not turned in on time, points will be deducted. Showing up to your teaching job without your lesson plans ready results in CHAOS! So, you have a week to get your assignments done. Do not wait until the day before they are due. Things always seem to happen the day before something is due. Plan ahead.

C. Excused Absences: Attendance is required at each class meeting. **If you cannot attend class, contact your instructor immediately** and explain the situation. Students are granted excused absences from class for the following reasons:  Illness of the student or serious illness of a member of the student’s immediate family, the death of a member of the student’s immediate family, trips for student organizations sponsored by an academic unit, trips for university classes or research presentations, trips for participation in intercollegiate athletic events, subpoena for a court appearance, and religious holidays.  Students who wish to have an excused absence from this class for any other reason must contact the instructor in advance of the absence to request permission. The instructor will weigh the merits of the request and render a decision. Students must arrange to have the class videotaped for later watching if any absence is planned, or if you are ill and cannot attend class in person, or out of town on a trip, you may virtually attend class via Skype, Zoom, FaceTime, etc. if at all possible and if the professor is notified in advance. Unexcused absences will result in points deducted from the participation grade. Appropriate documentation for all excused absences is required. Please see the [Student Policy eHandbook](http://www.auburn.edu/student_info/student_policies/) for more information on excused absences (<http://www.auburn.edu/student_info/student_policies/>). Email documentation to your professor as soon as it is acquired.

D. Make-Up Policy: If an exam or assignment is missed, a second chance will be given only for university-approved excuses as outlined in the Student Policy Handbook [www.auburn.edu/studentpolicies](http://www.auburn.edu/studentpolicies) . Arrangement to take the make-up exam or turn in assignments late must be made in advance or as soon as possible if illness occurs. Students who miss an exam or assignment because of illness need a doctor’s statement for verification of sickness and should clear the absence with the instructor the day they return to class. Late, unexcused assignments should be turned in for feedback, even when points are deducted.

E. Unannounced quizzes: There may be unannounced quizzes on the reading assignments. Quiz scores will be averaged in with Reflections on Reading Assignments. Why do teachers give pop quizzes? Motivation to stay up with the readings. Life is full of pop quizzes. It’s awful to be caught unprepared in life.

F. Disability Accommodations: Students who need accommodations are asked to electronically submit their approved accommodations through AU Access and to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are needed immediately. If you have a conflict with my office hours, an alternate time can be arranged. To set up this meeting, please contact me by e-mail. If you have not established accommodations through the Office of Accessibility, but need accommodations, make an appointment with the Office of Accessibility, 1228 Haley Center, 844-2096 (V/TT).

G. Honesty Code: All portions of the Auburn University student academic honesty code (Title XII) found in the [*Student Policy eHandbook*](http://www.auburn.edu/student_info/student_policies/) will apply to this class.  All academic honesty violations or alleged violations of the SGA Code of Laws **will** be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee. Assignments WILL be run through the university’s plagiarism detector. You may feel crunched for time, and if so, contact me for extra time instead of copying another’s work. You may be confused at times, and if so, contact me for help instead of copying another’s work. My job is to help you learn and if you plagiarize, I can’t help you learn. As a teacher, it’s important to be aware of how and why students may cheat. I hope you deal seriously with plagiarism with your own students someday. If you find that you need to use someone else’s idea, just cite and reference it! If you need to use someone else’s words, just cite them, add a reference, and put the words in quotation marks. Plagiarism is a moral and legal minefield (Park, 2006). Plagiarism is a SERIOUS issue, and because of that, all incidents will be reported to the Office of the Provost. (What I put above in parentheses is a citation, and below, is a reference. Get used to doing this. Google Scholar makes it easy to copy and paste the APA reference.)

Park, C. (2006). In other (people's) words: Plagiarism by university students--literature and lessons. *Assessment & Evaluation in Higher Education*, *28*(5), 471-488.

F. Course contingency: If normal class and/or lab activities are disrupted due to illness, emergency, or crisis situation, the syllabus and other course plans and assignments may be modified to allow completion of the course. If this occurs, and addendum to your syllabus and/or course assignments will replace the original materials. If class is cancelled, a notice will be sent out over Canvas, so make sure your settings route all announcements to your email.

G. Professionalism: As faculty, staff, and students interact in professional settings, they are expected to demonstrate professional behaviors as defined in the College’s conceptual framework. These professional commitments or dispositions are listed and paraphrased below.

* Engage in responsible and ethical professional practices in class, in schools, and in the community. *Behave yourself in the schools, and in the community. Follow the rules. Do not break laws. Be a role model.*
* Contribute to collaborative learning communities in class and in schools. *Get along with your peers and your professors.*
* Demonstrate a commitment to diversity in class, in schools, and in the community. *Respect each other. Celebrate our differences. Listen. Care.*
* Model and nurture intellectual vitality. *Care about learning. Show your students this! Demonstrate your curiosity!*

**Course Contingency:** If normal class activities are disrupted due to illness, emergency, or crisis situation, the syllabus and other course plans and assignments may be modified to allow completion of the course. If this occurs, an addendum to your syllabus and/or course assignments will replace the original materials.

**Health and Participation in Class**

You are expected to monitor your health. Your health and safety, and the health and safety of your peers, are my top priorities. If you are experiencing any symptoms of COVID-19, or if you discover that you have been in close contact with others who have symptoms or who have tested positive, you must notify me. My hope is that if you are feeling ill or if you have been exposed to someone with the virus, you will stay home to protect others and arrange to participate in class virtually. Please do the following in the event of an illness or COVID-related absence:

● Notify me in advance of your absence, if possible

● Provide me with medical documentation, if possible

● Keep up with coursework as much as possible

● Participate in class activities and submit assignments remotely as much as possible

● Notify me if you require a modification to the deadline of an assignment or exam

● Finally, if remaining in a class and fulfilling the necessary requirements becomes impossible due to illness or other COVID-related issues, please let me know as soon as possible so we can discuss your options.

**Health and Well-Being Resources**

College is difficult, and academic and personal stress is a natural result. Everyone is encouraged to take care of themselves and their peers. If you need additional support, there are several resources on campus to assist you:

● Student Counseling and Psychological Services (<http://wp.auburn.edu/scs/>)

● AU Medical Clinic (<https://cws.auburn.edu/aumc/>

● If you or someone you know are experiencing food, housing or financial insecurity, please visit the Auburn Cares Office (<http://aucares.auburn.edu/>)

Per the Biggio Center Suggestions:

**AI Policy: Permitted when Assigned in this Course with Attribution**

In this course, students are permitted to use Generative AI Tools such as Microsoft Copilot, ChatGPT, Claude, or Gemini for specific assignments, as designated by the instructor. To maintain academic integrity, students must disclose any use of AI-generated material. As always, students must properly use attributions, including in-text citations, quotations, and references. Students should exercise caution and avoid sharing any sensitive or private information when using these tools. Examples of such information include personally identifiable information (PII), protected health information (PHI), financial data, intellectual property (IP), and any other data that might be legally protected.

A student should include the following statement in assignments to indicate use of a Generative AI Tool: “The author(s) would like to acknowledge the use of [Generative AI Tool Name], a language model developed by [Generative AI Tool Provider], in the preparation of this assignment. The [Generative AI Tool Name] was used in the following way(s) in this assignment [e.g., brainstorming, grammatical correction, citation, which portion of the assignment].”