**1. Course Number:** CTSE 5040/6040

**Course Title:** Technology and Applications in Secondary Mathematics Education

**Credit Hours**: 4 semester hours

**Prerequisites**: MATH 2660; Admission to Teacher Education

**Date Syllabus Prepared:**  June 2007; Revised August 2021

**2. Instructors:**

| **Dr. W. Gary Martin**  martiwg@auburn.edu  Office hours: MW, 10:00-10:50 p.m.,  Haley 5008, or by appointment via Zoom | **Ms. Lizzy Barlow**  ekb0054@auburn.edu  Office hours: TBA |
| --- | --- |

**3. Texts or Major Resources:**

Alabama Department of Education. (2019). *Alabama college and career ready standards for mathematics*. Montgomery, AL: Author. Downloaded from <https://wgarym.info/2019alcos>

Dick, T., & Hollebrands, K. F. (Eds.) (2011). *Focus in high school mathematics: Technology to support reasoning and sense making*. Reston, VA: National Council of Teachers of Mathematics.

National Council of Teachers of Mathematics. (2014). *Principles to actions: Ensuring mathematical success for all*. Reston, VA: Author.

Other course readings as assigned.

**4. Course Description:** Use of technological tools to enhance mathematics teaching and learning

**5. Course Objectives.** *Alignment of objectives with the Alabama Quality Teaching Standards (AQTS) is noted.*

By the end of this course, students will be able to:

* Use a range of mathematics-specific technology tools (e.g., graphing calculators/apps, computer algebra systems, spreadsheets, dynamic geometry, and statistics software) to explore and solve mathematical problems drawn from the secondary school mathematics curriculum, and evaluate the relative strengths and weaknesses of those tools.
* 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*

In particular,

* Assess advantages and limitations of current and emerging technologies, and on-line and software content to facilitate teaching and student learning.
* Use technology tools that are responsive to diversity of learners, learning styles and special needs of all students, and the ability to design learning experiences incorporating those technologies.
* Use technology tools for instruction, student assessment, management, reporting purposes, and communication with parents/guardians of students.
* 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*
* 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*
* 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*

**6. Course Content and Schedule:**

| WEEK OF | MAJOR TOPIC | MAJOR ASSIGNMENTS |
| --- | --- | --- |
| 16-Aug | Introduction |  |
| 23-Aug | Spreadsheets |  |
| 30-Aug | Spreadsheets |  |
| 6-Sep | (Labor Day) Spreadsheets |  |
| 13-Sep | Graphing Software | Exam 1 |
| 20-Sep | Graphing Software | Project 1 |
| 27-Sep | Graphing Software |  |
| 4-Oct | Dynamic Geometry | Exam 2 |
| 11-Oct | Dynamic Geometry | Project 2 |
| 18-Oct | Dynamic Geometry |  |
| 25-Oct | Statistics Software | Exam 3 |
| 1-Nov | Statistics Software | Project 3 |
| 8-Nov | Other Applications |  |
| 15-Nov | Synthesis | Lab Experience Reflections Completed |
| 22-Nov | Thanksgiving |  |
| 29-Nov | Synthesis | Project 4 |
| 6-Dec | Tuesday, Dec. 7, 8:00-10:30 | Final Exam |

**7. Course Requirements/Evaluation:[[1]](#footnote-1)** In achieving the goals of this course, students will:

1. **Reflections.**
   * Complete readings and assignments and participate in class and on-line forums (e.g., blogs, wikis, microblogging).
   * Evaluation: (15% of the total grade)
     + Quality of reflections
     + Maintenance of an up-to-date personal blog/website for the course, including all reflections and projects
2. **Projects.**
   * Prepare projects on selected mathematics problems or topics demonstrating proficiency with a variety of technological tools and presented in a variety of formats; demonstrate how they might be used in the classroom
   * Evaluation: (four; 30% of the total grade) -- A format and rubric will be given for each project

**CTSE 6040**: An additional project will be required, due on the final day of class.

1. **Field Experiences.** (Note: Practicing teachers enrolled in the course can complete variations of these tasks based on a select class that they are teaching.)
   * Participate in virtual field experiences designed to explore how technology can support students’ mathematical thinking (a total of 18 hours). These experiences include the following activities:
     + Interview a secondary mathematics teacher to gather information about technology use during instruction and their school’s classroom management system and technical architecture to support the instructional program.
     + Develop and present or co-present a secondary mathematics lesson using technology.
     + Participate in on-line professional development events and training related to the content of the course; additional information to follow.
   * Evaluation: (20% of grade)
     + Detailed log of activities, including a reflective paragraph describing what you learned from the experience.
     + Presentation of data from the interview of a secondary mathematics teacher.
     + Reflection on the lesson taught, including what happened and what you learned from the experience.
2. **Exams.** Take exams to show progress of knowledge (3 exams and final; 35% of the total grade)

**NOTE:** All posted reflections should follow legal and ethical guidelines, including proper citation of sources using APA style.

**Grading.** All assignments will be graded on a 5-point scale (5=A; 4=B; 3=C; 2=D; 1=F; 0=not turned in) and weighted averages will be computed following the percentages given in the previous sections. Final grades will be assigned by rounding to the nearest whole number; i.e., 4.5 and up is an A, 3.5 and up is a B, and so forth. As percents: 90%=A; 70%=B; 50%=C; 30%=D; below 30%=F.

**8. Class Policy Statements:**

* **Attendance.** Each student is expected to attend all classes as scheduled (whether on-line or virtual) and participate in all class discussions and activities. Unavoidable absences must be documented and cleared with the instructor in advance if possible. The second non-approved absence from class and each succeeding unapproved absence from class will result in a lowering of the student's final grade by one letter grade.

Students are also expected to attend all scheduled field experiences. An unexcused absence may also lead to action as a violation of the Standards of Professional Conduct, as outlined below, with resulting actions impacting their continuation in the program.

* **Late Assignments.** Any assignment that is submitted after the announced due date will have one letter grade deducted from it per day late. Students should reach out to their instructor immediately to discuss any concerns. 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.
* **Make-up Policy.** Students who miss scheduled will need to contact the instructor and turn in the valid excuse within 48 hours from the time that the exams were given. The makeup exam schedule is determined by the instructor and will need to be done within ONE week (5 work days) from the time that the exams were given. Students who miss the makeup without valid excuses will get zero on the exam. Valid excuses include: 1) illness documented by a physician, 2) evidence of personal or family emergency, and 3) official university excuses.

The format, questions and difficulty-level of make-up exams are not guaranteed to be the same as the normal exam, which are at the discretion of the instructors. Students are not allowed to choose the make-up dates or formats on their own.

* **Unannounced Quizzes.** The instructor may give unannounced quizzes as deemed necessary, to be included as a part of the exam score.
* **Faculty Communication and Feedback.** Any communications should be directed to the instructor’s Auburn email address. Responses will be provided within 24 hours whenever possible. If students have concerns about communication or feedback, they should always contact their instructor first. Students should explain their concerns as clearly as possible without judgment or emotion. Effective communication is an important skill, and every interaction in their program is an opportunity to develop this skill.

***Your Auburn University email address is the university-approved form of communication between instructors and students.*** Please ensure that your notifications are set correctly to ensure timely delivery. Additionally, it is your responsibility to read course announcements sent by your instructor. These are posted in Canvas, and you can configure your notification preferences to receive an email each time a new announcement is posted.

* **Diversity Statement.** All people have the right to be addressed and referred to in accordance with their personal identity. Many people might go by a name in daily life that is different from their legal name. In this classroom, we will refer to people by the names that they go by. Pronouns are a way to affirm someone's identity. They are simply a public way in which people are referred to in place of their name (e.g. "he" or "she" or "they" or "ze" or something else). In this classroom, you are invited to share what pronouns you go by, and we will refer to people using the names and pronouns that they share.
* **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 immediately needed. If you need accommodations but have not established them, make an appointment with the Office of Accessibility, 1228 Haley Center, 334-844-2096.
* **Academic Integrity.** Auburn University has adopted an Honor System proposed by its students and faculty to promote academic integrity and has enacted the following code:

*“We, the faculty, instructors, and students of the (University course here) pledge to fulfill our mutual responsibilities to each other and the academic community at large with honor and integrity in order to build and maintain a climate of respect and trust that will enhance our research, teaching, and learning. We will support the Honor System of the School, and will not tolerate activities that undermine academic integrity.”*

Academic dishonesty is an offense that will be reported to the Academic Honesty Committee. Please refer to the following document for further information regarding academic honesty: [Auburn University Student Academic Honesty Code](https://sites.auburn.edu/admin/universitypolicies/policies/academichonestycode.pdf)

* **Standards of Professional Conduct.** 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 below:
  + Engage in responsible and ethical professional practices
  + Contribute to collaborative learning communities
  + Demonstrate a commitment to diversity
  + Model and nurture intellectual vitality

Students will be asked to sign a contract affirming Standards of Professional Conduct for the secondary mathematics program. Failure to comply with those standards may lead to actions including dismissal from the lab experience, the course, and/or the Secondary Mathematics Education Program.

* **Face Coverings.** The university permits individual faculty members to require face coverings in their classrooms and instructional laboratories. All students enrolled in this course are required to properly wear a face covering that covers the nose and mouth while inside the classroom, laboratory, studio, or office. Failure to comply with this requirement represents a potential Code of Student Conduct violation and may be reported as a non-academic violation. Please consult the [Classroom Behavior Policy](https://sites.auburn.edu/admin/universitypolicies/Policies/PolicyonClassroomBehavior.pdf) for additional details.
* **Students are encouraged to provide feedback on their experiences in the course using AU eValuate.**

1. Students in CTSE 6040 will complete all assignments, with additional requirements as stated. [↑](#footnote-ref-1)