

# CONCEPTUAL FRAMEWORK

## MISSION

The mission of the Auburn University College of Education is to build a better future for individuals, our state, our nation and our world. We fulfill our mission by preparing competent, committed and reflective professionals as we engage in outstanding teaching, cutting-edge research and meaningful outreach.

## VISION

Our vision is one of transformation. We strive to be and prepare agents of change. We seek to establish and work collaboratively within socially responsive learning communities that value the mosaic of a diverse society. Our vision includes engaging in the continuous learning necessitated by a rapidly advancing world; identifying and addressing critical issues related to the education of all people; and using technology to broaden and support learning opportunities. Ours is a vision of change embracing the inclusive, collaborative and technological aspects of our mission, thereby establishing us as a college representing educational advocacy and innovation in the 21st century.

## PHILOSOPHY, PURPOSE AND GOALS

Our philosophy of learning and teaching emphasizes that building a better future for all means creating learning environments for diverse learners that acknowledge the active, collaborative and ever-evolving nature of learning. This philosophy also values teaching that promotes the development of safe, stimulating learning communities enriched with diverse perspectives; is grounded in reasoned and purposeful decision making; and is enacted in proactive, flexible and self-regulating ways.

### COLLEGE OF EDUCATION



The keystone, the topmost stone of an arch, serves as a visual reminder of our mission and our goals. Just as the keystone supports and holds an arch together, education holds intact the promise of a better future for all. We believe that education is the keystone of opportunity and equity in a richly diverse, increasingly technological, and ever-changing world. It is the critical building block that enables individuals and societies to flourish in a global community.

**1. Course Number:** CTSE 5040/6040  
**Course Title:** Technology and Applications in Secondary Mathematics Education  
**Credit Hours:** 4 semester hours (LEC 3, LAB 2)  
**Prerequisites:** CTSE 5040: MATH 2660; Admission to Teacher Education  
CTSE 6040: Admission to a graduate program in secondary mathematics or departmental permission  
**Corequisites:** None

**2. Date Syllabus Prepared:** June 2007; Revised August 2014

**3. Texts or Major Resources:**

- 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.
- National Governors Association Center for Best Practices & Council of Chief State School Officers. (2010). *Common Core State Standards for Mathematics*. Washington, DC: Authors.
- 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
8/17	Course Introduction	
8/24	Dynamic Geometry	
8/31	Dynamic Geometry	
9/7	Spreadsheets	
9/14	Spreadsheets	Project 1
9/21	Graphing Applications	
9/28	Graphing Applications	
10/5	Computer Algebra Systems	Midterm
10/12	(Lab Experiences)	
10/19	(Lab Experiences)	Project 2
10/26	(Lab Experiences)	
11/2	Statistics Software	On-line Professional Development Assignment
11/9	Use of On-line Resources	
11/16	Synthesis	Lab Experience Assignments
11/23	Thanksgiving Break	
11/30	Synthesis	Project 3
Final	Monday, Dec. 8, 8:00-10:30	

**7. Course Requirements/Evaluation:**<sup>1</sup> In achieving the goals of this course, students will:

- a. On-line Discussions.
  - Complete readings and assignments, write daily reflections (one-paragraph) posted on-line, and participate in class and on-line forums (e.g., blogs, wikis, microblogging). Topics to include:
    - Instructional strategies that promote student learning using technology
    - Use of technology to address special needs
    - Legal issues in the use of technology
    - Effective use of technology for communications with parents and students
    - Use of electronic resources in professional development
    - Evaluation of students' use of technology
    - Assessment of technology resources related to mathematics available at a secondary school
    - Critiques of various technological resources
    - Identification of on-line professional development resources
  - Evaluation:
    - Quality of reflections (15% of the total grade)
    - Maintenance of an up-to-date personal blog/website for the course, including all reflections and projects (5% of the total grade)
- b. 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: A format and rubric will be given for each project (three; 30% of the total grade)

**CTSE 6040:** An additional project will be required, due on the final day of class.
- c. Lab 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 scheduled lab placement (6 three-hour blocks), including the following activities:
    - Conduct a review of your teacher's use of technology in instruction, in maintaining contact with parents and students, and in continued professional development and growth.

---

<sup>1</sup> Students in CTSE 6040 will complete all assignments, with additional requirements as stated.

- Analyze the school's classroom management system and technical architecture to support the instructional program.
  - Develop and present or co-present a lesson to a secondary mathematics classroom using technology
  - Evaluation:
    - Detailed log of activities, including reflection on what you have learned. (5% of total grade)
    - Lesson plan taught, along with reflection on what happened and what you learned from the experience. (5% of total grade)
  - d. On-line professional Development.
    - Participate in an on-line professional development event related to the content of the course.
    - Evaluation: Two-page reflection on the experience and how on-line professional development might support your continued professional growth (5%)
  - e. Exams. Take exams to show progress of knowledge (midterm and final; 35% of the total grade)
- CTSE 6040:** An additional take-home final examination will be required.

#### NOTES:

- 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 4-point scale (4=A; 3=B; 2=C; 1=D; 0=F) 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., 3.5 and up is an A, 2.5 and up is a B, and so forth.

#### 8. Class Policy Statements:

- Participation: Students are expected to participate in all class discussions and participate in all exercises. 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.
- Attendance: Each student is expected to attend all classes as scheduled, including lab sessions held off campus. If an exam is missed, a make-up exam will be given only for University-approved excuses as outlined in the Student Policy eHandbook ([www.auburn.edu/studentpolicies](http://www.auburn.edu/studentpolicies)). Arrangement to take the make-up exam must be made in advance. Students who miss an exam 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. Other unavoidable absences from campus must be documented and cleared with the instructor in advance. The second non-University 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. An unexcused absence for a scheduled lab session in the schools may also lead to action as a violation of the Standards of Professional Conduct, as outlined below.
- Unannounced Quizzes: The instructor may give unannounced quizzes as deemed necessary, to be included as a part of the exam score.
- 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).
- Honesty Code: The Student Academic Honesty Code (see Student Policy eHandbook) will be strictly enforced.
- 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 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 dismissal from the lab experience, the course, and/or the Secondary Mathematics Education Program.

- **Students are encouraged to provide feedback on their experiences in the course using AU eValueate.**