

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.

CTSE 4030. Curriculum and Teaching in Secondary Mathematics
Course Syllabus, Fall 2010

1. **Course Number:** CTSE 4030
Course Title: Curriculum and Teaching I: Mathematics Education
Credit Hours: 4 semester hours
Prerequisites: Admission to Teacher Education, CTMD 4010
Corequisites: None
2. **Date Syllabus Prepared:** April 1998; Revised December 2004, January 2007, August 2008
3. **Course Materials:**
National Council of Teachers of Mathematics. (2009). *Focus in High School Mathematics: Reasoning and Sense Making*. Reston, VA: Author.
National Council of Teachers of Mathematics. (2000). *Principles and Standards for School Mathematics*. Reston, VA: Author.
Fendel, D., and Resek, D. (1998). *Baker's Choice*. Emeryville, Ca.: Key Curriculum Press, Inc. (Not required for purchase.)
Other course readings as assigned
4. **Course Description:**
To familiarize prospective mathematics teachers with effective strategies for teaching and evaluating high school mathematics. (AU Bulletin)
5. **Course Objectives.** The goal of this course is to prepare prospective teachers who:
 - are familiar with the contemporary high school curriculum, including the NCTM *Principles and Standards for School Mathematics*, *Alabama Course of Study: Mathematics*, and innovative textbook series. **TE (1)(a)2,3;(1)(b)¹; CP 1,2,10²**
 - can effectively engage in mathematical problem solving, including spatial reasoning, using a range of problem solving strategies appropriate for high school mathematics, and assessing the reasonableness of their solutions. **TE (1)(a)5,6;(1)(b)6; CP 1**
 - can logically defend their solutions to problems. **TE (1)(b)2; CP 1**
 - can effectively use math manipulatives and technological tools, including calculators and computers. **TE (1)(a)4,9;(1)(b)7; CP 2,10**
 - can effectively use mathematics vocabulary and symbols. **TE (1)(a)7;(1)(b)3; CP 1,10**
 - can effectively select or create a range of models or representations to develop solutions to problems, including data graphs and concrete models. **TE (1)(b)8,9; CP 10**
 - understand the integrated nature of the curriculum, both within mathematics and across disciplines, as well as in everyday life. **TE (1)(a)13;(1)(b)11; CP 1,2**
 - are aware of how students think about and learn mathematics, including both formative and summative evaluations of student learning. **TE (1)(a)12; CP 5**
 - are aware of a range of instructional strategies and approaches and are conversant with their advantages and disadvantages.
 - use of math manipulatives and technological tools, including calculators and computers. **TE (1)(a)4,8,11; CP 2,10**
 - can effectively plan and carry out instruction, utilizing appropriate tasks that promote mathematical inquiry. **TE (1)(a)10, (1)(b)5**
 - can effectively pose questions and structure discourse to promote student learning. **TE (1)(a)12; CP 5**
 - can differentiate instruction to meet the needs of all students, helping them move from concrete to more abstract ways of thinking. **TE (1)(a)12; CP 5**
 - are aware of the social and affective dimensions of mathematics teaching and learning, including attention to cultural diversity and special needs. **TE (1)(a)(12); CP 5**

¹ TE numbers refer to the Alabama Teacher Education Objectives, section 230-3-3-.13

² CP numbers refer to the Auburn University Candidate Proficiencies

6. Course Content and Schedule:

Week of	Primary Topics	Lab Experience	Major Assignments
16-Aug	Introduction (<i>classes start Wed.</i>)		
23-Aug	Reasoning and Sense Making		
30-Aug	Process Standards		
6-Sep	(cont.) (<i>no class on Monday</i>)		
13-Sep	Principles for Mathematics; Number and Measurement	Observe class	Reflection on microteaching (due one week after completion)
20-Sep	Algebraic Symbols	Help with seatwork	
27-Sep	Functions	Help with seatwork	MIDTERM
4-Oct	Equity	Lead discussion of homework	
11-Oct	Statistics	Lead discussion of homework	
18-Oct	(open)	Organize and lead lessons	
25-Oct	(open)	Organize and lead lessons	
1-Nov	(open)	Organize and lead lessons	
8-Nov	Curriculum Planning	Wrap-up	Portfolio Lesson Plan Reflections; PWS
15-Nov	Assessment	Wrap-up	Professional Dev. Reflection Student analysis
22-Nov	THANKSGIVING		
29-Nov	Next steps		Lab experience learning log; Unit Plan
9-Dec	FINAL EXAM, 12:00-2:30		FINAL EXAM

NOTE: This Course Calendar is presented for informational purposes only and is subject to change.

7. **Course Requirements/Evaluation:** In achieving the goals of this course, students will complete the following assignments. See the corresponding appendices for additional details. Weighting for each section in the final grade is given below in parentheses.
- A. complete readings and other assignments, and participate in class discussions (15% of final grade)
 - B. participate in a “micro-teaching” experience (20%)
 - C. participate in laboratory experience and complete associated assignments (25%)
 - D. complete a unit plan (10%)
 - E. take two examinations (midterm and final; 30%)

All written assignments given in advance should be typewritten and follow 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:

Attendance. Each student is expected to attend all classes as scheduled, including lab sessions held off campus. The second unexcused absence from class and each succeeding unexcused absence from class will result in a lowering of the student's final grade by one letter grade. Each failure to report for a scheduled lab session will result in a lowering of the student's final grade by two letter grades.

Unannounced quizzes: The instructor reserves the right to include unannounced quizzes; see Appendix A.

Accommodations for students with special needs. Students who need special accommodations should make an appointment to discuss the Accommodation Memo during regularly-scheduled office hours as soon as possible. In the event of a conflict with scheduled classes, please arrange an alternate appointment time. If you do not have an Accommodation Memo but need special accommodations, please contact the program for Students with Disabilities, 1244 Haley Center, 844-2096.

Honesty Code: The University Academic Honesty Code and the *Tiger Cub* Rules and Regulations pertaining to *Cheating* will apply to this class.

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. Failure to comply with those standards may lead to dismissal from the lab experience, the course, and/or the Mathematics Education Program.

Appendix A. Participation in Class Activities

Students are expected to attend and participate fully in all class activities, including completing assigned reading and other assignments, and participating in class discussion.

1. Prepare 1-2 page reflections to the readings or other course activities, as assigned. Specific topics will be assigned, due the following class period.
 - In addition, the instructor may assign a topic to be completed during class, constituting an "unannounced topic."
2. Participate in professional development experiences, totaling at least four hours. Prepare a two-page summary and reflection on your experiences, including thoughts on the relevance of the experience and its connections to material discussed in class.

Appendix B. Participation in "micro-teaching" experience.

The class will explore *Cookies*, a curriculum unit designed for grades 9-12. Students will engage in the unit as learners of mathematics, and will additionally serve as a co-teacher for one class period.

1. Prepare detailed solutions to problems from the unit, along with other reflections on the experience.
2. Compile and organize a portfolio of mathematical work, following directions given within the unit.
3. Lead a class discussion of one lesson. A lesson plan should be prepared according to the format required by the Mathematics Education Program, and approved at least two days in advance.
 - The final lesson plan should be turned in *within one week*, along with a two-page written reflection on the experience.

Appendix C. Participation in a laboratory experience.

Students will be assigned in groups (generally pairs) to observe a particular class period in a high school. You will visit the class the week of September 20 (or sooner) and ending the week before Thanksgiving, for a total of 9-10 weeks. For three of those weeks, beginning the week of October 18, you will observe at least 2-3 times per week. Your responsibilities will grow across the time you are in the school, as outlined below. Your instructors will attempt to come out and observe at least one lesson in which you participate.

Week of:	Frequency:	Duties:
20-Sep	At least once per week	Observe class
27-Sep	At least once per week	Help with seatwork
4-Oct	At least once per week	Help with seatwork
11-Oct	At least once per week	Lead discussion of homework
18-Oct	Multiple visits per week	Lead discussion of homework
25-Oct	Multiple visits per week	Organize and lead lessons; continue to assist
1-Nov	Multiple visits per week	Organize and lead lessons; continue to assist
8-Nov	At least once per week	Organize and lead lessons; continue to assist
15-Nov	At least once per week	Wrap-up
29-Nov	If needed to finish	

GUIDELINES

1. You must complete at least 12 observations for CTSE 4030. Each of these observations must by state regulation last at least three hours (including travel time). Thus, you may need to arrive a little early to watch the end of the previous period, or stay a little late to watch the beginning of the next period.
2. Your observations should be confirmed in advance with your cooperating teacher. Any absences from planned observations must be reported *in advance* to your cooperating teacher, your university instructor, and your colleagues from the class with whom you are collaborating. Consequences for no-shows are outlined in your class syllabus.
3. You should sign in at the school office upon arrival on school premises.
4. You and your group will need to conduct several lessons (jointly and individually) in late October. Both your cooperating teacher and your university instructor must approve the topics and your lesson plan. Lesson plans should confirm to the format required for the class.
5. You must exercise professional conduct in all you do, including proper attire, appropriate relations with your students, and courtesy to your cooperating teacher and other members of the school.
6. Please strive to be helpful while you are in the class. You are not, however, expected to assist with grading or other clerical duties.

REQUIREMENTS

1. Keep a learning log in which you reflect on each visit, including what happened and what you learned.
2. Select a student within the class who has special needs by your third observation.
 - a. Throughout your lab experience, make special attempts to interact with the student.
 - b. Reflect on your observations of the student's progress in your log.
 - c. At the end of the semester, prepare a 2-3 page summative analysis of the mathematical progress of the special needs student you are tracking.
3. Prepare at least three lessons, co-taught with a colleague. Each lesson must have a lesson plan in the format used by the Mathematics Education Program, approved at least five days in advance by your cooperating teacher and your course instructor.
 - a. The first lesson should be jointly prepared by the group and co-taught.
 - One copy of that lesson should be turned in, along with a 2-3 page reflection on the lesson prepared by each member of the group.
 - Each member should turn in a reflection, including a summary of what happened, an analysis of how the lesson worked, and what you learned as a future teacher of mathematics.
 - b. Each member of the group should subsequently prepare an individual lesson for which he/she will be the lead teacher. Other members of the group should play assistive roles. Following the lesson, the group member should debrief with group members and the cooperating teacher.
 - The lead teacher should turn in the final lesson plan, along with commentary following the College of Education's Professional Work Sample protocol.
 - The other group members should turn in a personal reflection on what happened, following the format above.

Appendix D. Unit Plan

Students will work collaboratively to prepare a unit plan on a selected topic, including:

- A general plan for a unit—including the objectives for the unit, specific resources to use, an outline of lessons, and a rationale for your choices (4-5 pages). This plan should be aligned to the TEAM-Math Curriculum Guide.
- Sample lessons from that unit (one per group member) -- including a rationale for each that identifies how it fits into the unit plan and promotes student learning.
- A unit assessment based on the unit objectives.

Appendix E. Midterm and final examination

A two-hour midterm will be given near the midpoint of the semester, possibly spread over two days. A 2.5-hour final examination will be given following the times set forth in the University's final exam schedule. Exams will consist of mathematical problems to be solved, "short response" items that can be answered in a paragraph, and "long response" items that require up to one page to answer. All items will be based on class readings and class discussions, with a focus on synthesizing and analyzing the information that has been covered across the course.