**CTSE 7970 Syllabus, Spring 2022**

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| **Instructor Information**  W. Gary Martin  [martiwg@auburn.edu](mailto:martiwg@auburn.edu); 334.599.3141 | **Class Meetings**  Mondays, 5:00 – 8:00 PM  Haley 5075 or via Zoom |

1. **Course Number:** CTSE 7970, Spring 2022

**Course Title:**  Special Topics – Mathematical Knowledge for Teaching

**Credit Hours:** 3 Semester Hours

1. **Date Syllabus Prepared:** January 2022
2. **Resources**

Association of Mathematics Teacher Educators. (2017). *Standards for preparing teachers of mathematics.* Author. <http://amte.net/standards>

Ball, D. L., Thames, M. H., & Phelps, G. (2008). Content knowledge for teaching: What makes it special? *Journal of Teacher Education*, *59*(5), 389–407.

Conference Board of Mathematical Sciences. (2001). *The Mathematical Education of Teachers*. American Mathematical Society and Mathematical Association of America. <https://www.cbmsweb.org/archive/MET_Document/index.htm>

Conference Board of Mathematical Sciences. (2012). *The Mathematical Education of Teachers II*. American Mathematical Society and Mathematical Association of America. <https://www.cbmsweb.org/archive/MET2/met2.pdf>

Franklin, C. A., Bargagliotti, A. E., Case, C. A., Kader, G. D., Scheaffer, R. L., & Spangler, D. A. (2015). *The statistical education of teachers*. American Statistical Association. <http://www.amstat.org/education/SET/SET.pdf>

Kilpatrick, J. (2019). A double discontinuity and a triple approach: Felix Klein’s perspective on mathematics teacher education. In: Weigand H.-G., McCallum W., Menghini M., Neubrand M., Schubring G. (eds), *The legacy of Felix Klein*, ICME-13 Monographs. Springer. https://doi.org/10.1007/978-3-319-99386-7\_15

Klein, F. (1932). *Elementary mathematics from an advanced standpoint: Arithmetic, algebra, analysis* (3rd ed., Vol. 1, E. R. Hedrick & C. A. Noble, Trans.). (Original work published 1924).

Klein, F. (1939). *Elementary mathematics from an advanced standpoint: Geometry* (3rd ed., Vol. 2, E. R. Hedrick & C. A. Noble, Trans.). Macmillan. (Original work published 1925).

Ma, L. (1999). *Knowing and teaching elementary mathematics: Teachers' understanding of mathematics in China and the United States.* Lawrence Erlbaum Associates.

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, *15*, 4-14.

1. **Course Description:** Understanding mathematical knowledge for teaching and how it can be developed.
2. **Course Objectives:** Students will:

* Explore mathematical knowledge for teaching (MKT) from an historical point of view, to understand how conceptions of MKT have evolved over the past century.
* Develop their personal understanding of MKT in a variety of content areas.
* Use, experience, and analyze various projects aimed at developing MKT to better understand how it might be developed.
* Analyze various assessments of MKT that have been developed.

1. **Tentative Course Schedule.** We have regularly scheduled class meetings on Mondays throughout the semester, except for January 17 (Martin Luther King, Jr. Day) and March 7 (Spring Break). We will also have a class meeting on April 25 in lieu of a final examination.
2. **Course Requirements/Evaluation:** A letter grade will be assigned, based on the following activities, with the weight for each area given in parentheses.

**A. Participation in Course Activities (40%)**: Students are expected to attend and participate fully in all course activities. This includes:

* Attending and participating in all class meetings. All assigned readings should be completed prior to the class meeting.
* Completing all assigned homework assignments and coming to class prepared to discuss them.
* Periodically respond to specified prompts in an on-line discussion forum.
* Students may be assigned topics on which to prepare a presentation to the class. Unless otherwise specified, a slide deck should be prepared in advanced, including relevant references.

Evaluation of these activities will be conducted on an on-going basis, with feedback provided on any areas in which improvement is needed.

**B. Leading an Exploration of Exemplary Materials (30%)**: Students will work in a pair or trio to lead the class in examining instructional materials drawn from an exemplary project which has as its goal the development of mathematical knowledge for teaching. This will include:

* Co-leading 4-5 sample lessons that exemplify the approach taken by the project. An overall plan should be submitted in advance, as well as plans for the individual lessons.
* Leading a class discussion of the project’s framework, including one or more articles written by the project authors that help to understand the approach they have taken and the consequences of that approach.
* Facilitating a question-and-answer session with the project authors, if possible. (Your instructor will work with you on setting that up.)

**C. Issue Brief (30%):** Each student will prepare a formal issue brief on some aspect of developing mathematical knowledge for teaching.

* The topic must be approved in advance by the instructor. Topics may include mathematical knowledge for teaching a particular area of mathematics, some cross-content aspect of developing mathematical knowledge for teaching, or another approved topic related to developing mathematical knowledge for teaching.
* A formal paper should be submitted, following APA style, approximately 10-15 pages in length, including references. You will be invited to submit a draft prior to final submission, after which no revisions will be accepted.
* A final, formal presentation of the paper will be given at the end of the semester.

1. **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.
* **Unannounced Quizzes.** The instructor may give unannounced quizzes as deemed necessary, to be included as a part of the class participation 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.**