SYLLABUS FOR TEACHING OF MATHEMATICS
MATH 40970-080/60003-080
SPRING 2010

Essentials

Instructor contact information:
Name: Loren Spice
E-mail: lspice@tcu.edu E-mails whose subject lines contain the full course number, '40970-080' or '60003-080', will receive faster replies.
Web page: [http://faculty.tcu.edu/lspice/Classes/60003/Sp2010](http://faculty.tcu.edu/lspice/Classes/6003/Sp2010) (The address is somewhat cumbersome to remember, but a link is available from my home page, [http://faculty.tcu.edu/lspice](http://faculty.tcu.edu/lspice).
Office: TTC 315
Phone: (817) 257-6340
Office hours: • Monday 1:30–2:30 PM (shared with Calculus I)
• Tuesday 9:30–11:30 AM (shared with Calculus I)
• Thursday 2–3 PM (shared with Calculus I) and 6–7 PM
• Friday 4–5:30 PM
Course time and location: TTh 4:30–5:50 PM in TTC 352
Textbook: Custom coursepack: “Teaching of mathematics”
Calendar: Below are some significant dates for the course. The most up-to-date calendar will always be available at the [course web page](http://faculty.tcu.edu/lspice/Classes/60003/Sp2010).

nth Tuesday: Weekly homework due (for classes on (n – 2)nd Thursday and (n – 1)st Tuesday)
nth Tuesday: Lecture plan due (for lecture on nth Thursday)
nth Thursday: Reflection due (for lecture on (n – 1)st Thursday)
Tuesday, January 19: Lecture preferences due
Thursday, February 4: Final-project preferences and interim journal due
Thursday, March 4: Interim journal due
Thursday, April 1: Final-project draft and interim journal due
Tuesday, April 27: Final project and in-class presentation due
Thursday, May 6: Journal due (by 5:30 PM)

Grading: If you earn at least 80% of the course credit, then you will receive at least a B-; if at least 84%, then at least a B; and if at least 87%, then at least a B+. The C (at least 70% but less than 80%) and D (at least 60% but less than 70%) ranges are apportioned similarly. The difference for the A range is that faculty are not permitted to grant a grade of A+. If you earn less than 60% of the course credit, then you may receive an F.

Depending on class performance, these thresholds may be lowered—that is, it may happen that, for example, some students will receive an A- with less than 90% of the course credit—but they will never be raised.

The course components will be weighted as follows.

Homework: 15%
Journal: 10%
In-class lectures: 5% lesson plan + 10% lecture + 5% post-lecture reflection (each)
Final project: 10% written report + 10% presentation
Lecture feedback forms: 10%
In-class participation: 5%
Course components

**Policy on written work:** It is particularly important that a teacher be able to express him- or herself clearly. Accordingly, all written work that you submit should be neatly hand-written or typed: and you must express yourself in complete English sentences.

**Homework:** Homework will be assigned (by you or by me!) at most class meetings. Homework assignments will contain a mixture of mathematical and pedagogical questions.

**Journal:** You will be expected to keep a journal of your experiences in, and impressions of, this course. The format of the journal will be determined by class consensus. Interim journals will be submitted at several points during the semester (see "Calendar"). They will help me to shape and improve the course, so I encourage you to be complete and candid. You will be graded only on completeness.

**In-course lectures:** You are responsible for delivering 2 in-class lectures. One will be on a high-school level mathematics topic, and the other on an undergraduate-level topic and its connections to high-school mathematics. A list of sample topics is available at [http://faculty.tcu.edu/lspice/Classes/60003/W2010/handouts/Lectures.pdf](http://faculty.tcu.edu/lspice/Classes/60003/W2010/handouts/Lectures.pdf); you are also welcome to suggest your own (subject to my approval). You must submit a lesson plan 1 class meeting before your lecture, and a reflection at most 1 week after your lecture.

When your classmates lecture, they are the teachers, and it remains your responsibility to be a good student. In particular, you are expected to take notes. These notes will be crucial for the feedback forms that you will fill out, which will be a part of your grade. These forms will be handed in on the next class after each lecture.

When listening to the lectures on high-school material, you should try to interact as would a (well behaved and studious) high-school student. When listening to the lectures on undergraduate material, you may be learning new material; you should interact as you would in any other mathematics class. This in-class participation will also be part of your grade.

**Final project:** The final project will require you to investigate the applications of high-school mathematics, either at the college level or in a real-world setting. A list of sample topics is available at [http://faculty.tcu.edu/lspice/Classes/60003/W2010/handouts/Projects.pdf](http://faculty.tcu.edu/lspice/Classes/60003/W2010/handouts/Projects.pdf); you are also welcome to suggest your own (subject to my approval). You must submit a draft of the project several weeks before the final due date.

The final project consists of a written report and a 10- to 15-minute presentation in the last class meeting. The written report must answer the following questions:

1. How is the topic covered in high school? You may find it helpful to describe a lesson plan, or to describe how a high-school student might be expected to solve sample problems. Supplement your answer with references to specific textbooks and/or curricula.

2. How is the topic applied at a higher level? Again, it is useful to investigate how it is used to solve specific problems, especially since the full theory may be excessively abstract. You may refer to textbooks, but solutions and exposition should be in your own words.

3. Does existing high-school instruction provide an adequate background for students to understand the applications?
   - If so, what are examples of specific ways that textbooks or curricula address the application?
   - If not, what could be changed to provide the necessary background?

4. How can an understanding of the application that you have described help a teacher to present the material better, or a student to understand it better?

You must submit a draft copy of your written report (see "Calendar") to make sure that everything is on track. I will read it and return it with comments, and you may re-submit it up to once per week thereafter.

**Goals:** As might be expected from a course called “Teaching of mathematics”, we will focus primarily on 2 topics in this course: teaching, and mathematics. There will be little to no consideration of the topic of ‘teaching’ on its own; we will be concerned solely with the effective teaching of mathematics (particularly, of specific mathematical topics, as appropriate).

This is a small course, and, as such, we have a lot of flexibility. I am very interested in covering some of the connections of high-school mathematics to upper-level (undergraduate) mathematics, a
goal which makes this mostly a ‘content’ course; but I am very receptive to student comments and feedback, and will be happy to spend more time discussing the teaching (to high school students) of particular topics—i.e., the ‘method’—on request. I especially welcome feedback from those who are currently teachers, or who have had teaching experience, about difficulties, opportunities, and strategies from their own classrooms.

Resources: We will use resources such as

- Posamentier’s “Teaching secondary mathematics: Techniques and enrichment units”;
- Beckham, Thompson, and Rubinstein’s “Teaching and learning high-school mathematics”; and
- the NCTM’s publication “Mathematics teacher”

to find ways of improving mathematics instruction. While you may be interested in obtaining copies of these resources (in particular, you are encouraged to become a member of the NCTM at http://www.nctm.org), they are not required for the course.

LEGALESE

Attendance policy: Although there is no grade assigned for attendance, it will play a valuable role in your understanding of the course material. The small class size makes this particularly important. Whenever possible, please notify me of any necessary absences in advance.

Changes and student contact information: All information in this syllabus is subject to change. Any changes will be announced on the course web site, and significant changes will be announced by e-mail to your preferred address.

Your preferred e-mail address for this class is, by default, your TCU e-mail address. If you wish to change your preferred e-mail address, then you must e-mail me from your current preferred e-mail address, or speak to me in person.

Statement on disability services at TCU: The following statement is common across all courses at TCU. For more information, please see http://www.acs.tcu.edu/Disability.htm.

Texas Christian University complies with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973 regarding students with disabilities. Eligible students seeking accommodations should contact the Coordinator for Students with Disabilities in the Center for Academic Services located in Sadler Hall, 11. Accommodations are not retroactive; therefore, students should contact the Coordinator as soon as possible in the term for which they are seeking accommodations. Further information can be obtained from the Center for Academic Services, TCU Box 297710, Fort Worth, TX 76129, or at (817) 257-7486.

Academic conduct: As in all courses, you will be governed in this class by the academic conduct policies described in the student handbook http://catalog.tcu.edu/undergraduate. The following paragraph appears in Section 3.4 of that handbook.

Any act that violates the academic integrity of the institution is considered academic misconduct. The procedures used to resolve suspected acts of academic misconduct are available in the offices of academic deans and the Office of Campus Life, and are listed in detail in the Undergraduate Catalog (Student policies > Academic conduct policy details). Specific examples include, but are not limited to:

Cheating:

- Copying from another student’s test paper, laboratory report, other report, or computer files and listings;
- Using, during any academic exercise, material and/or devices not authorized by the person in charge of the test;
- Collaborating with or seeking aid from another student during a test or laboratory without permission;
- Knowingly using, buying, selling, stealing, transporting, or soliciting, in its entirety or in part, the contents of a test or other assignment unauthorized for release;
- Substituting for another student or permitting another student to substitute for oneself.
Plagiarism: The appropriation, theft, purchase or obtaining by any means of another’s work, and the unacknowledged submission or incorporation of that work as one’s own, offered for credit. Appropriation includes the quoting or paraphrasing of another’s work without giving credit therefore.

Collusion: Unauthorized collaboration with another in preparing work offered for credit.