

## Statement of Teaching Philosophy

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My former experiences as a student and current experiences as an instructor of mathematics collectively shape my philosophy of teaching. The first college mathematics course I taught was in 1997, and since then I have been the instructor of record for more than 20 courses that range from freshman Calculus to a graduate course in Finite Element Methods. I was the recipient of an annual college-wide teaching award as a graduate student, and I have consistently received high scores and favorable comments on student evaluations of my teaching. In addition, I thoroughly enjoy teaching and interacting with students.

However, I know that there are always methods to improve the effectiveness of my teaching. I have tried to learn something from every course I have taught and every teacher I have taken a course from. Here I will describe some aspects of my current teaching approach:

- Establishing a comfortable learning environment in the classroom.
- Developing students' critical thinking and technical communication skills.
- Using an adaptive lecture style in the classroom.
- Incorporating student projects into mathematics courses.
- Incorporating technology into my teaching.

**Establishing a comfortable learning environment in the classroom.** I believe one of the best approaches to getting students' attention and making them comfortable in sometimes intimidating classroom environments is to get to know them. I try to develop an individual rapport with as many students as possible, with the goal being to get to know all of them. Through the class roll information, I can determine their major, and then try to relate topics we are covering to applications they may encounter in their field of study. Interacting with students during class is not only a good way to get their attention and keep them involved, but it also significantly reduces the likelihood that one of the students will create a distraction. I also want my students to gain a positive attitude about mathematics and mathematics instructors, and for them to attain a level of confidence with their work and comfort in seeking help when needed. I do this by initiating and maintaining positive interaction with them in class discussions and office hours, as well as by taking a constructive approach in grading their work.

**Developing students' critical thinking and technical communication skills.** In preparing students for upper-level classes in their field of study, it is important to develop their critical thinking skills. I accomplish this in my approach to lecturing by emphasizing the logical construction of new concepts from existing ones. In addition, when working through examples, I highlight the steps we take in our methods in an effort to convey the logical problem-solving process.

I place a great deal of importance in written responses on quizzes and exams and verbal explanations in class discussions. I feel that effective technical communication skills are a very important, almost critical, component of a student's education. I often implement this requirement by having students write a sentence that states the result of a problem. On an exam, I sometimes include a problem that asks the student to explain, in words, the procedure they would use for finding a solution. I find that, through activities that focus on effective technical communication, students are able to acquire a measure of confidence for discussing the individual concepts and subject as a whole.

**Using an adaptive lecture style in the classroom.** When I stepped in front of a class to deliver my first lecture, I was quite nervous and did not pay much attention to the students in the classroom. Now when teaching, I am always cognizant of how students are receiving the lecture, constantly seeking feedback from them and adapting my approach as needed. I gauge the level of the students' comfort with the work I am presenting on the board and will always say something about what I write, beyond just what is written. I emphasize explanations of the mathematics involved in the steps we take, as basic as I think it needs to be for the students to fully grasp it. In preparing for class, I will often construct additional examples or alternate definitions that I may not use, but are at my disposal if I feel that some students would benefit from alternate explanations of the same concept. I strive for clarity and will constantly remind students of the connection to the previous topics that are the foundation for the current idea.

**Incorporating student projects into mathematics courses.** I often require students to complete projects in my math courses. There are many benefits to doing this, including:

- Introducing students to the idea of performing research on a mathematical topic.
- Improving student's technical communication skills, including technical document preparation, and composing and delivering presentations.
- Alerting students to some of the many applications of mathematics in the real world.
- In some courses, getting students to work together as part of a group.

I try to use student projects as a teaching opportunity on multiple levels. I usually announce the project and outline the requirements early in the semester, often on the first day of class. Usually the student(s) are allowed to choose the topic of their project, with my approval and assistance if needed. I then establish milestones for the students to accomplish throughout the semester, giving them short-term tasks while keeping their attention focused on the long-term goal of completing the project. An example of this is to require the students to give me a short summary of their progress about midway through the semester. If a written report is to be turned in as part of the project, I will often require the students to give me a draft to review and provide comments and suggestions. I sincerely enjoy working with students on projects and am usually impressed with how well the students do.

**Incorporating technology into my teaching.** In the early stages of my teaching experience, I was intimidated by the idea of including technology in the classroom. Instead of perceiving this as a burden, I saw this as a challenge and learned how to use technology effectively in classroom discussions. In recent semesters, I have used Mathematica, Maple, and MATLAB in various courses, I have lectured using a tablet PC, and I always use an online course management tool such as Blackboard. I consistently seek to integrate emerging technologies into my teaching as they become available.

**Summary.** I plan to grow as an instructor by continually adapting to new technologies, different course materials and curriculum, variations of teaching styles, and students with different learning styles. The future will undoubtedly present numerous innovations that we can take advantage of to improve the quality and delivery of mathematics education. I will view these developments as opportunities to progress and I eagerly await them. In closing, I want to say that there are many components that drive my philosophy of teaching, and my philosophy today will continue to progress as I do through my teaching career. For me, teaching mathematics, and doing everything I can to teach well, is truly rewarding.