

TEACHING STATEMENT

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My motivation for teaching mathematics is to impart the passion I have for the subject to my audience. I think mathematics is aesthetically beautiful while at the same time fundamentally utilitarian, and I want other people to see that too. With this goal in mind, I try to not only teach mathematics, but to teach it well. I always strive to be clear, engaging, and energetic.

My approach to teaching mathematics stems from the first mathematical presentation I gave. In a high school pre-calculus class, I spoke for one class period on Pascal's triangle. I was extremely excited about the material, and it showed in my talks. While speaking, I could feel my audience respond to my enthusiasm. I have striven for similar responses in my audience ever since.

My experiences in teaching represent what I feel is continuous incremental improvement in my teaching style. Every time I have taught a course, I hope the students will walk away with greater knowledge, but I always walk away learning a new aspect of or tool for my teaching.

For instance, as an undergraduate I was an undergraduate teaching assistant for honors calculus II and III, including duties in a Mathematics Resource Center (an extracurricular low-stress resource for the students). The Resource Center showed me how to engage students in mathematics by using questions as prompts to help them find answers for themselves. I still believe that to learn new material, a student must figure out how to solve related problems by themselves, understanding the rationale of the answer instead of using brute memorization. As teaching assistant in the calculus courses, I was in charge of the recitation sections. In this capacity, I got to know the students well. I found that the students responded best with personal interactions. To this day, I encourage students to approach me whenever they are confused, including calling out questions during class. I believe keeping them involved helps them to be engaged with the class material, and encourages active learning.

As a graduate student, I had my first experience as instructor for stand-alone courses. I taught introductory matrix theory twice to classes of around 20 students. Both courses went well, and I am happy to be able to claim that, based on my end of semester evaluations, I was placed on the Incomplete List of Teachers Rated as Excellent for both semesters, a list published by the Center for Teaching Excellence at UIUC. One of my goals for these courses was to focus on my clarity of explanation. In the first semester of this course, I gave midsemester informal feedback forms to my class. Their response was that although I have good explanations for new material, I needed to use more examples and spend more time explaining them. I concentrated on shifting the focus of my lectures from definitions and theorems to examples, doubling the number of examples I did per class but staying on pace. The students appreciated not only the change in style (which they felt helped them learn better) but also their influence on my teaching. The lessons for me were

twofold: tailor one's lectures to one's audience, and encourage and listen to student feedback.

As a postdoc at the University of California, Davis, last year I taught four courses. In the Fall quarter, I was the instructor for a graduate level introductory topics course in geometric group theory. The topics course was my first experience with teaching at the graduate level. I chose to format the class so that I gave the majority of the lectures, while the remaining sessions were presentations by the graduate students. To me, this course emphasized the reward and utility of having an engaged and energized class. It is beneficial to have such a rapport with students. I also appreciated the experience with helping my students convey research mathematics to their colleagues.

In the Winter quarter, I taught my first large lecture: a calculus II class for nonmajors, with 95 students. Handling the logistics of managing that many students plus two TAs was certainly a learning experience for me. My biggest lesson from this class was to always ensure questions on tests are worded as precisely as possible.

In the Spring quarter, I taught two upper level undergraduate courses, one of which was on Euclidean and nonEuclidean geometry. For Euclidean geometry, it became evident midway through the quarter that the requisite textbook for the course was insufficient to meet my goals and the objectives of the syllabus. As a result, I had to compile reference material for my class from other sources, and recommend these materials to my class. Because of this, geometry was the most difficult course I have taught thus far, but I am happy to say my students appreciated my efforts. This year, I plan on working with the next instructor of the course on redesigning the syllabus.

Outside of teaching, I have pursued the teaching of mathematics through various venues. Most notably, I am currently in charge of two Research Experiences for Undergraduates (REUs) as well as a graduate VIGRE-sponsored Research Focus Group (RFG). The REUs have been an ongoing and rewarding project, begun this summer, which should both yield publishable papers. The RFG consists of a variety of activities, and in particular includes a graduate seminar series. The speakers in the seminar are usually graduate students (I plan to incorporate advanced undergraduate students in the Winter), talking about the quarter's theme, usually with my assistance. The Fall theme is open problems in low-dimensional topology, the Winter theme will be expander graphs and amenability, and the Spring theme will be branch groups.

I think that one of the principal and fundamental responsibilities of anyone in academia is to convey their insights to others. For me, teaching clearly, engagingly, and energetically is sharing a passion as well as fulfilling my personal obligations.