

Teaching Statement

Dorian Croitoru

I find teaching to be one of the most responsible endeavors, because it affects students' eventual interest in the subject. Teaching not only inspires me by giving new perspectives on topics related to my research, but also is a great opportunity to give back by passing on my knowledge to others. I have taught at several different levels, both at the University of Pittsburgh and at MIT. At Pittsburgh, I was a teaching assistant for an intermediate calculus course, which involved spending two to three hours a week in class discussing problems, holding office hours and grading homework and examinations. At MIT, I taught Calculus for Project Interphase in 2006, and the Linear Algebra summer course in 2007-2009, where I was responsible for all aspects of the course. Aside from the traditional classroom setting, I occasionally coached Moldova's International Mathematical Olympiad team during the summer and also conducted private tutoring. I find the most important aspects of teaching to be understanding the students, preparation and interaction with students.

First, in order to teach something effectively, we need to know the main goals of the audience, as well as their level of understanding (if any) of the subject. Are the students taking the course mainly as a general requirement or out of personal interest? Do they think of, say, matrices in terms of solving linear equations or as linear transformations? For instance, when teaching an introductory linear algebra course to engineering majors, there is little point in emphasizing heavily the geometric meaning of linear transformations as it is very likely that the students are more accustomed to matrices within the computational framework. Guiding students to a more conceptual understanding should still be an ultimate professional goal, but doing it directly is not always the most feasible way. Therefore, as soon as I start to teach a course, I try to get into the mindsets of the students, see their level of understanding of the subject and use that as a starting point.

Another important aspect of teaching is preparation. I have had the unfortunate experience of going to class unprepared. I lacked self-confidence, which immediately resulted in an overall decline of interest in the subject on the part of the students. I found myself inventing examples on the spot and was sometimes forced to start over when they turned out to be either too hard or too easy or not relevant enough. Therefore, I realized how important it is to take the time to prepare my presentations meticulously. I like to place great

emphasis on examples, which I choose both to motivate the theorems, and to help build the intuition behind them. When I explain a topic, I find it effective to try and show the main idea and hint that the details follow naturally. I try to remind students that many ideas don't come magically out of the blue, but instead are very natural and are often the only way to approach the problem at hand. Once the students realize that there is no mystery behind the topic, they can quickly master it by analyzing several examples. I try to anticipate the questions students may have or intricacies they might not notice, and decide beforehand how to address these.

Finally, I place great emphasis on interaction with students. It is very important to get into the mindset of the students and to make sure they grasp the material. Students should not come to lectures just to take notes, and then go home and study. Instead, I not only encourage my students to follow the material and ask questions in class but also try to engage them in an active discussion by asking them questions. Sometimes, when I see that my students are lost, I stop and wait until enough questions are asked and the issues at hand are cleared. This helps students get more out of lectures because soon they themselves start to expect to understand what is covered. I try to be accessible to students by holding convenient office hours and by keeping in touch via e-mail. During office hours and after class, I not only try to understand the needs of my students, but also try to get to know them better both mathematically and personally. I am very delighted when former students meet me randomly or stop by my office to discuss more advanced courses that they are taking or their career plans.

In the future, I want to teach a wide variety of math classes at both undergraduate and graduate levels. For most topics, I count on my teaching experience, on my spectrum of classes taken at Pittsburgh and MIT as well as on my problem-solving experience from mathematical competitions. I look forward to sharing my knowledge with students, and I believe that my teaching experience, will serve me in good stead.