TEACHING STATEMENT

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Experience. I have been an instructor since September 2008. The classes that I have instructed range from service courses such as the first-year Calculus sequence, Multivariable Calculus, Linear Algebra, Differential Equations, to upper division undergraduate classes such as Differential Geometry, to first year graduate classes such as General Topology. I have also assisted and taught the *Inquiry-based Learning* (IBL) sessions of several classes at the University of Chicago. I have taught classes with more than one hundred students at the Ohio State University. I have been the coordinator of a multi-session course - Multivariable Calculus - at Binghamton University. In addition to teaching college classes, I also have been a mentor to undergraduate students in the REU program at UChicago a couple of summers.

General principles and philosophy. I believe in a few principles that I deduce based on my experience from learning, teaching, and observing other people teaching mathematics.

First and foremost, in order to be a good teacher of mathematics one must be a good mathematician themselves. Second, one needs to be honest and true about what they teach. That is, I believe it is my job as a teacher to communicate *my* understanding and *my* perspectives. I should teach what I know, at least what I think I know, and what I come to know during the course of learning the subject while preparing for class. I should not teach what I do not truly understand or perspectives that I do not share or resent even if they are what is presented in the textbook. Third, a good teacher of mathematics must find enjoyment in discussing math. These three criteria are necessary qualities but may not be sufficient.

Lecture. Giving a good lecture is a delicate form of performance art. A good lecture must contain *good content* and must be delivered in an interesting, and preferably entertaining, manner so that the content is not ruined. A good lecture should provide motivation and guidance of what is important or what is fundamental, so that students know what to focus on when they try to learn the material later by themselves. A good lecture must inspire and should not decrease the motivation students had before the lecture. I learned from experience as audience member that a boring lecture exhausts the audience, so I put a lot of effort in making my lectures entertaining.

Content is still the most important thing of a lecture, and this is why the lecturer needs to be a good mathematician or at least have good taste in picking what examples to give in a lecture. There is great value in giving the simplest non-trivial example when it comes to introducing a new concept or illustrating a problem. This is something that I am obsessed about when I write my lecture. I try my best to teach my students new concepts by providing illustrative examples and pictures, rather than only stating definitions or even drawing commuting diagrams. I do, however, also expect my students to understand the generality of mathematical concepts and theorems, but this cannot be achieved without knowing good and basic examples.

Be available for students. I make sure I have enough office hours, and I am always happy to make appointments with my students. I enjoy talking about math (and physics) to students.

Teach my students how to think. I would like to discuss the question how students learn best. By this I do not mean how many type of differential equations they can solve symbolically by the end of a course on differential equations, for example. The question is how much students will learn how to learn and how to think by themselves in the course of learning the subject, which should also be proportional to how much of the course material they will learn.

There are two basic skills I want students to learn. First, it is important that they learn to question and formulate their confusion. Second, once they have achieved this, the question is how they can go about solving the problem or deduce more understanding.

I believe students learn most when they spend a lot of time trying to figure things out by themselves and then come to the instructors with thought out and explored questions. So I always make sure I have lots of office hours. Then in order to guide students to the answer and more understanding, I find it usually works better if I do not tell them the answer straight out, but ask them a series of guiding questions that hopefully will stimulate their thought process and help them find the resolution to their questions themselves. The method of IBL, which is a more flexible version of the Moore method, can trace its origin to the Socratic Learning method (e.g. see Plato's dialogue *Meno*). During my time as a graduate student, I assisted and taught several IBL courses, during which I developed some skills of asking guiding questions that lead students to find their own truth.

I believe a main part of my job is to help my students learn how to think if they have not learned that earlier, and however ambitious this may sound, to help them to develop independent minds of their own. From my experience, a lot of students coming to college have the wrong idea about math or about learning math. They seem to believe what they should learn in math classes is how to solve problems of certain types that are given in the course, and they do not have the slightest idea what to do for slightly different problems that require them to think. My goal is to find a way to help them have the courage to think when they encounter an unfamiliar problem and start asking questions as they learn.