TEACHING STATEMENT

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As a postdoctoral instructor at SUNY Stony Brook, I have taught a variety of courses ranging from Precalculus to Ordinary Differential Equations to graduate courses in Geometry/Topology and Lie Groups and Lie Algebras. I was also fortunate enough to teach several courses while a graduate student at Notre Dame, and I led a number of tutorial sessions for first-year calculus courses. These experiences have allowed me to develop as an instructor, try different methods, and most importantly enjoy teaching. I enjoy figuring out what will interest the students and how to make the material applicable to them. I enjoy thinking about mathematics, understanding various subjects better, and communicating this depth to students through interesting and multifaceted examples.

I feel the easiest way to state my teaching philosophy is to describe a typical lecture. While the content varies greatly between courses, the structure of my lectures is quite similar. I like to emphasize the big picture of a class, and I frequently begin with a reminder of what we have done so far and then proceed to develop the current lesson while making comparisons to previous material. Learning is not a linear process, but instead cyclic; by continuing to review things already learned, one's understanding deepens and aids in learning new material. I then introduce the main goal of the lecture, often by carefully working through an important and representative example. After doing so, and sometimes while going through each step, I show how one would generalize this process and try to explain why such a generalization works. In a graduate course, this is of course a rigorous process, but I still try to relate the theorems and proofs to an example. In lower-level courses, formal proofs are often not possible, but students can still learn a great deal from a heuristic argument based on examples. At this point, an upper-level course will usually focus on both proving the necessary lemmas and theorems and applying them. In a calculus course, the remainder of lecture focuses on the mechanics of how to work the problems and properly interpret their answers.

It is important for students to understand why the material is important and how it applies to them. This is easy for upper-level courses since I can explain where the students will use the material in later courses and their careers. Students in introductory courses are often more resistant to believing mathematics will benefit them. In these courses, I always emphasize the method of solving problems. Through conversations with my wife, an elementary school teacher, I learned that one of the biggest obstacles for both her students and mine was the same: word problems. The process of analyzing a problem, separating out the relevant information, and reinterpreting it in a formal mathematical language is extremely valuable in everyday life; I always emphasize its importance.

I have also discovered that my teaching is only as good as the homework problems assigned. While an enlightening lecture can aid the students in learning, ultimately students only learn something when they work through problems themselves. Consequently, much of my office hours are awkwardly filled by me forcing students, who wanted to be shown how to do a problem, to work through problems themselves.

I enjoy creating a lecture on the blackboard, as it allows me to work out mathematics in the way I want my students to. However, I am comfortable using online quiz/homework systems, and I periodically use computer animations to supplement lectures. I also like to use simple objects I can hold, whether it be a Play-Doh sculpture, an inflatable beach ball, or a piece of cardboard.

Finally, my teaching evaluations are available upon request and have always been very favorable with numerical scores above the university averages. I look forward to continuing my growth as a teacher, and I hope to be able to develop and teach interesting courses related and unrelated to my mathematical specialties. Possible examples include advanced undergraduate courses on the differential geometry of embedded surfaces or the geometry of physics, or a more elementary course on the mathematics of polling that uses current data from political races. Finally, I have mentored a high-school student conducting math research and would be interested in leading undergraduate research programs.