

## TEACHING STATEMENT

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**1. Introduction.** Teaching has been a part of my mathematical career since I began graduate school in 1998, and I have found it to be quite rewarding. In this statement, I hope to summarize my experience and to briefly describe the classroom environment that I try to create.

**2. Experience.** While I had been tutoring mathematics since high school, my first formal classroom experience came in 1998 when I accepted a graduate teaching assistantship at Johns Hopkins University. In addition to the courses for which I served as a teaching assistant, I was given the opportunity to be the lead instructor for a number of courses: *110.109 - Calculus II for Physical Sciences and Engineers*, Summer 2000; *110.302 - Differential Equations with Applications*, Summer 2001, Summer 2002, and Summer 2003; *110.312 - Introduction to Wavelets*, Fall 2001; and *110.105 - Introduction to Calculus*, Fall 2002. The most notable of these is the course on wavelets. This is a course that I proposed, designed from scratch, and entered into a competitive selection process. A Dean's Teaching Fellowship from the Krieger School of Arts and Sciences funded the course.

In addition to my teaching in the Department of Mathematics at Johns Hopkins University, I was also employed by the school's Center for Talented Youth summer programs and distance learning programs. During the summer of 1999, I was an assistant for the course *Investigations in Engineering*, which is designed to give middle and high school students a survey of the various types of engineering and some basic techniques used in these fields. As an instructor with the distance learning program, I guided students in grades 1-4 through basic mathematics using software developed by EPGY as well as through e-mail and telephone communication.

During my postdoctoral position at the Georgia Institute of Technology, I had the opportunity to teach *Math 2403 - Differential Equations*, Fall 2003; *Math 4581 - Classical Mathematical Methods in Engineering*, Spring 2004 and Fall 2004; and *Math 3770 - Statistics and Applications*, Spring 2005.

**3. Teaching Philosophy.** While using largely traditional classroom techniques, I try to make a semester in my courses anything but typical by giving extra attention to a few key details. First, a good amount of effort goes into making the students comfortable both in the classroom and in office hours. This is accomplished by encouraging questions, urging students to visit during office hours, and by trying to be personable and respectful to my students. I have found that students reciprocate my enthusiasm and the effort that I put into courses. As alluded to earlier, availability outside of the classroom is something that I see as extremely important. In addition to office hours, I make myself available on most days for appointments or drop-in assistance. I also try to make materials available outside

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of classroom hours by maintaining comprehensive course webpages and using e-mail to communicate with the class.

Within the presentation of material, I try to concentrate on portraying mathematics as a dynamic and evolving field. This can be done by presenting appropriate new mathematics, often simplified versions of my research or that of other faculty members at the school, or open problems. I distinctly remember being introduced to Goldbach's conjecture in an elementary number theory class; it greatly renewed my interest in the course and in mathematics as a whole.

When available, I also find it beneficial to present applications, especially ones related to material that the students previously studied or to material related to my students' majors. At times, this can be done with careful and limited use of technology and projects. For example, when I taught the course on wavelets, I assigned a final project. A number of students chose to implement wavelet-based algorithms, and one group decided to study image-based query algorithms. By the end of their project, this group had a database of several hundred images that one could query for a particular image by submitting a rough sketch. The speed of the query and the quality of the results were remarkable. From speaking to the students, I found that such projects helped to solidify their understanding of the material. I was especially delighted to hear, several months after the course had ended, that this particular group was continuing to maintain and update their implementation.

**4. Evidence of Effectiveness.** In addition to the Dean's Teaching Fellowship mentioned previously, I was awarded the William Kelso Morrill Award for Excellence in the Teaching of Mathematics from the Department of Mathematics at Johns Hopkins University in 2000. I had been given Honorable Mention in consideration for the same award the previous year.

Evidence of effectiveness can also be found in the comments of my former students. For example, statistics were compiled comparing the responses of the students concerning the instructor for all service courses in mathematics since the Spring of 1998 at Johns Hopkins University. My average score of 4.58 out of a possible 5.00 for *Introduction to Calculus* in Fall 2002 was the highest score for a non-tenured instructor.<sup>1</sup> Over the same period, only two senior faculty members had averages that exceeded 4.00. Comments from my other course evaluations have included "He's a fabulous, engaging, dynamic lecturer," "He makes the material very intuitive and easy to digest," and "(He) made the atmosphere so comfortable that you'd try and answer questions even if you weren't sure."

**5. Future Plans.** As my career progresses, I will work to continue to grow as an educator. I hope to try new things within the classroom, including further careful use of technology. Additionally, I hope to become involved in the direction of undergraduate (and graduate) research.

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<sup>1</sup>Statistics compiled by Prof. W. Stephen Wilson in the Spring 2003.