TEACHING STATEMENT

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"Oh, I'm terrible at math; I hate it."
"Wow, you're so much smarter than I am."
"Why?"

These are the most common responses I receive when I tell people that I do and teach mathematics. As a seemingly fundamental element of human mathematical interaction, statements such as these motivate my approach to teaching. This is the perspective many of my students bring to the classroom, and if I want to be effective in teaching my students concrete mathematical facts, I must first show them what math is, why it is important, and how it is beautiful. It is part of my job to instill in them the confidence they need to succeed. It is impossible to teach math well without remembering that you are teaching math *to people*, who must be involved and encouraged in every aspect of the course. With hard work and perseverance, I believe everyone can achieve success and learn to value the mathematics they are exposed to. The essence of my job, then, is to coach my students through their classes while showing them how to appreciate the process by which they master new skills.

My purpose is to value the aspirations of each of my students and find specific ways to use the math we encounter in class to help them attain their goals. By considering the diverse backgrounds and attitudes that they bring to my classroom, I aim to share the importance and elegance of mathematical thought with my students. My goal is to inspire each of them to value the discipline of mathematics and its role in society and to equip them with the specific tools and knowledge necessary to succeed in their classes.

Student engagement has always been a strong focus for me, and has been instrumental in my receipt of several honors, including our department's annual Award for Outstanding Teaching Assistants. I have also had opportunities to serve as instructor of record for three classes (which is atypical in our department), twice run a review session for younger graduate students taking the Algebra Prelim exam, and take on various other leadership and mentorship roles. In each of these, my holistic approach to teaching is fundamental to the way I approach my interactions with students.

Lectures: Over the course of my graduate school career, I have had the opportunity to lecture Math for Elementary School Teachers, College Algebra, and Contemporary Math, a course that covers basic concepts and serves as an introduction to college level mathematics. When designing courses, I strive to make each element engaging and worthwhile while building a cohesive whole that is organized, approachable, challenging, and achievable for each student. I start each semester with a clear idea of what my students need to accomplish in order to succeed in the course, and clearly communicate this to them on the first day of class. Beginning the semester with a course calendar that shows all of the assignments and the consistent schedule of when they are due allows students to quickly form a routine and spot potential scheduling conflicts in advance. Good organization is also key in promoting student engagement: when the whole class can easily see what is expected of them and what they can do to succeed, they are more likely to take ownership of learning the material.

Structuring my classes well gives me more time during the semester to invest in my students, and gives me room to be flexible. Whether the issue is a homework extension or a topic I need to spend more time on, when my courses are carefully planned, I have the freedom to make minor changes that will help my students succeed. This approach to planning not only makes my classes run smoothly despite inevitable unforeseen circumstances, but also demonstrates to my students that mathematics is a dynamic, versatile subject that can be mastered rather than a merciless machine that is out to wreak havoc on their futures.

While lecturing, I reinforce this perspective by presenting a range of examples and contexts for new ideas and encourage my students to interact with the material by asking questions and offering suggestions on what we might do next. By regularly asking, "how can you use this?" rather than just saying "this is useful," I both open the door to creativity in problem solving and give opportunities for each student to take ownership of their active role in the class. In keeping with an emphasis on flexibility and working with different learning styles, I have also put some effort into finding ways to assess my students' progress that are less stressful and more varied than traditional rubrics that base grades primarily on three or four long exams. In my College Algebra class, I gave short weekly exams, thereby lessening the amount of material and percentage of the overall grade associated with each test. This worked remarkably well, as my students stayed on top of what we covered each day and took each task seriously, but were less likely to become overwhelmed because the stress of learning the material was more equally spread over the whole semester.

Recitations: Another large portion of my teaching experience comes from leading recitation sections in Calculus and Finite Math. These classes are designed to supplement the large lectures and are usually spent tackling worksheet problems and reviewing material students have questions about. In this more loosely structured setting, as in office hours, my focus is primarily on generating good discussions about the concepts we are learning and helping my students understand from multiple perspectives exactly what they are trying to accomplish and how and why they are doing so. Practically, this often looks like asking questions. When a student hands me their work and asks "Is this right?" or "What do I do now?," I find that a simple "Yes" or "No" is far less instructive than handing the paper back and asking "Do you think it's right? Why?" or "What have you done so far?" The practice of explaining their work out loud frequently leads to the student answering their own question, as well as recognizing patterns, making connections with other parts of the course, and developing good mathematical communication skills.

Mentorship: Aside from my role as an instructor and recitation leader, I have had several opportunities to work with and mentor some of the younger graduate students and older undergraduates at UK. As the Lead Teaching Assistant for Business Calculus, I observed and provided feedback to the other recitation instructors, maintained a quiz writing calendar and offered advice throughout the writing process, and did other administrative tasks to assist the course coordinator. During this semester, I became acquainted with some of the challenges of running a large course and gained some valuable insight into how to do it well. One of the best ideas I saw is to occasionally ask open-ended clicker questions that are directed toward the students' experience in and out of the class, such as "What topic have you struggled with the most in this class?" or "What is the thing you like best about math?" While questions like this are certainly not a replacement for interacting with students, they are a practical way to collect class-wide input that can help me as an instructor in making the course as good as it can be, as well as giving each student a chance to be heard.

Last year, I led recitations for MathExcel, an intensive section of Engineering Calculus I and II that meets two hours longer per week and has smaller class sizes in order to provide students with the best chance of succeeding in the class. The structure of these courses allowed for personal investment and interaction with every student every class, which was a key contributor to the mathematical and personal growth I witnessed in my students over the year. In each of these semesters I oversaw two undergraduate assistants, who generally had little teaching experience, and worked with them to find the optimal way to help each student master the material. These were mutually beneficial partnerships, as each of my assistants learned how to lead a student through a problem and how to lead a class as a whole, and I became proficient at managing a more complicated classroom and working cooperatively with others to teach well.

In each of my roles, I believe that personally encouraging and holding each student to a high standard is the best thing I can do to ensure their success, both in and out of my classroom. Through the years, I have consistently seen remarkable results by teaching my students the joy of learning and growth as I guide them towards excellence. Many people I encounter wonder why I believe teaching math is important. I think my former student answered that question best in the note he left on his final exam, saying, "Math is not a subject that comes to me [easily] and growing up I have not enjoyed math, but I wanted to say thank you for making this an enjoyable class while challenging me at the same time." I believe in teaching math personally for students like him who, in just one semester, can learn to appreciate and excel in a subject that they have never before seen the beauty of. I believe in teaching math excellently for students who are willing to engage the material and are eager to learn even more about a subject they are growing to love. I believe in teaching math well for all of my students, who I hope will achieve success in every area of their lives and put in a good word for mathematics along the way.