TEACHING STATEMENT

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I have been involved in the process of teaching mathematics in some form or other for ten years and had a wide range of experiences. I began as an undergraduate grader, and have worked as private tutor, teaching assistant running discussions and tutorials, and have taught several courses as a primary instructor. I have taught students individually, and in classes as small as eight and as large as 65. I have taught students in high school mathematics courses; 2-year program college courses in precalculus and calculus; first-year university courses in calculus, algebra, discrete mathematics; upper-division undergraduate courses in differential equations, linear algebra and set theory; and a seminar for graduate students preparing for a complex analysis qualifying exam. For three years during my Ph.D. program I acted as mentor for other teaching assistants in the department.

I have lived and worked in diverse metropolitan areas of both French and English Canada, in California, and in Portugal. I have therefore experienced teaching in different institutions and educational systems, each with a very diverse student population. An explanation or classroom approach which works with one class may not work with another. I have learned the importance of being flexible and paying close attention to my students. This background has also given me an understanding of the requirements of students who face challenges in learning mathematics because of the difficulty of using a foreign language, as teacher as well as through firsthand experience.

When I taught at Dawson College, in Montreal, I was teaching evening classes, in which the students included both recent high-school graduates as well as adults returinng for continuing education. While teaching in Montreal, I developed an understanding of the importance of presenting material in different ways appropriate to the variety of learning styles. I further developed this understanding of teaching methods at the University of California, Riverside, where I taught both as Teaching Assistant and as the primary instructor in a number of classes. I learned at UCR how to adapt this to larger classes than those I had taught at Dawson College, and to anticipate the variety of needs even when unable to speak personally to each student. While there are many rules of thumb and strategies I have found to be successful, my first principle is always that teaching is a process involving two-way communication, and I will always invite my students to ask questions, and to discuss their understanding of the material. Since the group may be too large (or too unresponsive) for this to work well in the classroom, I make a point of reminding students when and where my office hours are, encouraging them to communicate with me by email and reassuring them their questions and participation are welcome. An open, positive, and encouraging attitude is an important part of my approach to keeping students interested and focused on the subject being taught.

The method of presenting the material must also help this end. Whenever possible, I try to make clear - over an entire course, and especially over a single lecture - what are the few core ideas to which everything can be related. Students often have difficulty, especially in classes such as calculus or differential equations which present many methods for solving particular problems such as integrals or DE's, in seeing the subject as more than a "cluttered

toolbox" with no theme and suited only to memorizing pages of formulas. I try to help as many students as possible to discover that even learning to use this toolbox becomes easier by understanding how the methods all derive from common ideas.

I have learned to take different approaches with different students when working with them individually, and also the importance of balancing these in a larger class. One of the most difficult differences to deal with are those in levels of preparation. In a first-year college calculus class, for example, there will be students whose most recent mathematics education was a high-school precalculus class some years before, but others will have already successfully taken calculus at a slightly lower level. In such a class, I feel it is important to present the same material in different ways. Some students will need to see, for instance, the basic idea of a derivative as the "slope of a curve", for the first time. Other students will understand this, and know some methods for finding derivatives of particular functions, but will need to see the precise definitions of both limit and derivative. My approach is to show both, emphasizing the development of the intuitive picture into a technical definition, giving each student something new, and perhaps clarifying what they may already know.

Since the learning styles of students vary, there are students who will understand a derivation which is algebraic in style, but others who find it confusing and will learn better by seeing a picture. I strive to explain concepts in a balanced way, showing both pictures and formal derivations when relevant. When dealing with students individually, I try to learn which style of explanation works best for each. For the same reason, I try to give both a verbal explanation and a written one.

A common problem students have is being unsure what an acceptable answer to a question consists of, exactly what terminology or notation means, or when a proof is correct. Here I try to help by example as well as by explaining. When speaking, I take care to use terminology correctly, especially if it is clear that students have a shaky understanding of technical terms. I strive to ensure that students see explicitly at least once what a completely acceptable answer to a certain kind of question looks like. I believe it is important for students in learning concepts to learn how to communicate them correctly: hazy expression suggests hazy comprehension.

Keeping an accessible and friendly attitude, while presenting a good example of rigorous and clear communication of mathematical ideas are difficult to balance. But I believe that by keeping both goals in mind, and by listening to and learning from students as well teaching them, it's possible to reach both those who are excited by mathematics and those who are intimidated by it, and all those in between. This is my goal in teaching.

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