

I began teaching mathematics in 2005 as an undergraduate at Western Michigan University (WMU). Since then, I have taught math both as a TA and an instructor. I have TAed for a variety of courses, including several different calculus courses, Differential Equations, Linear Algebra, Introduction to Proofs, Introduction to Analysis, and Statistics. I have taught as an instructor at UC San Diego for Calculus and Differential Equations, and at WMU for College Algebra.

Teaching mathematics at the university level can be a difficult task. I see math as an art form, a beautiful creative process that happens to have ties to some aspects of “real” life. Students often see mathematics in a different way, as a methodical process, with a “right” and “wrong” approach for each problem. They see success as “getting the right answer” for every question. My goal for every class I teach is to break this perspective, to impart to students that there is more to math than finding a numerical solution for an equation.

To this end, I teach with great enthusiasm, often using props or physically demonstrating the ideas being discussed in the course. As an instructor for Multivariable Calculus, I would bring in objects to help my students understand the shapes of our functions of two variables and their derivatives. I also often brought a laptop to graph, animate, or otherwise visualize ideas such as contour curves, gradients, and partial derivatives.

When I teach as instructor, I spend a lot of time on conceptual understanding, rather than working example problems, and every exam I write includes questions about theory, even in lower division courses. At WMU, I would often put mathematical puzzles related to the course material as “bonus” problems on quizzes, encouraging students to think about how mathematics works, rather than how to solve specific types of linear equations. My goal with these kinds of questions is to encourage students to study key ideas, rather than specific problem-solving strategies, so that students develop confidence in their own abilities to understand mathematics. I make myself as accessible as possible, so that students have many opportunities to ask questions.

When I have taught as a TA for classes like calculus, I devote at least a third of each recitation section to conceptual review, pressing students for questions about the key ideas rather than homework problems. I bring a computer to class to help with visualization when it is needed. Teaching upper division classes, I try to stress proof techniques and talk about alternative ways to think about each problem, rather than focusing on the specific proof proposed for a particular problem. My goal as a TA is to get the students thinking about the ideas of the course, rather than the problems they have been set to answer.

Overall, my teaching philosophy is that the most important thing we can do for

students is equip them with the right tools for approaching the subject at hand. Once this has been done, solving problems comes naturally. In order to accomplish this goal, I believe we must put emphasis on the underlying ideas of the course, rather than on the techniques for specific problems. I believe that if we set the bar high for our students, and demonstrate joy and enthusiasm, they will rise to meet the challenges we have placed.

Comments from my students

Please excuse any grammatical errors; these quotes are verbatim.

- Excellent at highlighting and giving importance to key components and equations of the class while at the same time going through them and explaining how to use them. (Multivariable Calculus, Spring 2009, TA)
- She is clear, concise, and perhaps most importantly, is able to relate the material in a manner that allows you to understand the fundamental principles upon which it is built. (Linear Algebra, Winter 2010, TA)
- She shows a great deal of understanding to the material and promotes learning and questions that involve the class. (Mathematical Reasoning, Winter 2011, TA)
- Mary Radcliffe is extremely engaging and obviously has a great passion for math. She makes it a point to clearly and verbally explain the concepts behind the problems we do in class. (Multivariable Calculus, Fall 2010, Instructor)
- She really knew how to present the material in a way that I could understand it (Differential Equations, Summer 2010, Instructor)

Complete teaching evaluations and student comments can be found at <http://math.ucsd.edu/~mradclif/teaching.html>.