

Prof. Davie is super-awesome. She's enthusiastic, articulate, organized, and draws good pictures.

Point-Set Topology student evaluation

Over the course of my tenure as an instructor at UCSB I have been chosen to teach many stimulating courses: Non-Euclidean Geometry, Point-Set Topology, Elementary Knot Theory, Combinatorics, graduate level Topics in Topology, and more. In all of my courses, I have pushed my students towards a deeper exploration of the material presented in class. I expect them to master the cognitive levels of knowledge and comprehension, but, furthermore, I want them to analyze, synthesize and evaluate the information being presented. I encourage in-class participation from all of my students—especially the shy ones. In smaller class settings I ask students to put problems on the board and explain their methods to the rest of the class. In larger settings I encourage group work in which the students discuss the problems with other students nearby. I favor an inquiry-based approach to teaching, particularly in more advanced classes. I do not spoon feed my students. I allow self-discovery and investigation because I believe this leads to a very true sense of understanding.

These efforts and others have made me a good instructor in this, the beginning stage of my career. I have received positive feedback from both colleagues and students. I was honored with the UCSB Department of Mathematics 2009 Mochizuki Memorial Fund Award in recognition for outstanding achievement in mathematics instruction. I enjoy reading favorable comments in my teaching evaluations and have had several students take a second course of mine because they have so enjoyed the first. I have been asked by two former students to guide summer reading courses. However, I do not believe that my achievements in teaching come solely from my classroom practices. Yes, I have formed my opinions on effective and ineffective pedagogy, but my teaching philosophy extends beyond the classroom.

My teaching philosophy begins with a sincere desire for my students to learn the mathematics. Students know when an instructor genuinely cares for their success, and the most effective way to show this is through personal interactions. My concern for their success becomes evident when I take the time to stay later in office hours because a student hasn't had

the “aha” moment yet. I express my interest in them by showing patience when explaining and reframing a problem again and again until they finally see a way to the solution. I show them that I care by giving the failing student just as much attention as the gifted student. It is easy, indeed, to be excited by an extremely talented student that shows promise for graduate study, but, the challenge lies in showing that same fervor for the student who is struggling just to pass the class. My goal is not only to impart information and awaken their curiosity on a particular topic, but also to let my optimism for their success shine through no matter where they stand on the grading spectrum. It is true that this approach becomes increasingly more difficult as the enrollment count approaches infinity—I have taught classes with an enrollment of 130 students! In these situations even small gestures like learning many of their names do not go unnoticed by students.

Secondly, I believe it is extremely important to promote confidence evenly throughout the class. As a student, I was shy and not very confident in my abilities. As a result, I understand how a lack of confidence can potentially stunt personal growth. For example, right now in my Combinatorics class I have a handful of students who are exceedingly sharp. I can always count on one of them to come up with a creative solution to the problem posed. In contrast, I have a few students who never volunteer answers during class, but judging from the work that they hand in, many of them are just as capable as the more vocal students. This phenomenon could be attributed to a lack of confidence. Thus, I make sure that I am balanced in who I am recognizing to answer questions and even call on those who do not have their hand up. I am diligent in giving my students positive reinforcements whether or not their answer is correct by making comments like “almost,” or “you’re on the right track.”

I am also unyielding in my expectations of my students. Sometimes it pays to be a “mathematical coach” of sorts. For example, this quarter I have a student whom I also had in class during a previous quarter. I noticed this quarter that the work that he was turning in was at a much lower quality than before—and that was *if* he managed to turn in the work. His homework had problems missing, and the ones that were there were only half attempted. To top it off, his work was barely legible (a pet peeve of mine). I wrote

him a note on his homework telling him that I was disappointed in his recent performance and that I expected more from him. I knew what he was capable of, and he was not living up to his previous work. After the next class meeting he came to me and apologized for his laziness and thanked me for my concern. He assured me that he would step up his efforts for the rest of the quarter. Sure enough to my surprise and delight, he made a B- on the midterm.

I also bring to the table a commitment to increase the number of students from underrepresented minority groups in undergraduate and graduate level mathematics. I am thrilled to have had the opportunity to showcase this commitment while working in such a diverse state as California. I was chosen to be the postdoctoral associate for the 2009 Mathematical Sciences Research Institute Undergraduate Program (MSRI-UP) at MSRI in Berkeley, CA. This is an 8-week summer REU for approximately 18 undergraduates who belong to underrepresented minority groups in mathematics. During that time I, along with the program leader, oversaw a research project in Coding Theory for two groups of these undergraduates. I am confident that my sharing of my personal story and my daily guidance and encouragement (mathematical and otherwise) influenced some of them who may have been on the fence about continuing on to graduate study. Furthermore, I am currently the faculty advisor for a former student of mine and McNair Scholar, Lynette Cortes. Over the summer, I guided her in a reading course in Linear Algebra which led to a technical report and poster on applications of Linear Algebra which she presented at the McNair National Conference in Delavan, Wisconsin. Throughout the school year, I have continued to mentor her by suggesting future research problems, summer research programs like MSRI-UP or the Summer Mathematics Program for Women at Carleton College, and conferences like SACNAS and the Nebraska Conference for Undergraduate Women in Mathematics. I also was a mentor for the Enhancing Diversity in Graduate Education (EDGE) summer program in 2006, as well as a participant in the program in 2001. These examples exhibit only the beginnings of my commitment to diversity in mathematics classrooms.

In a profession in which teaching is sometimes thought of as a secondary responsibility, I take very seriously my commitments to my students. I understand that most of them will

not go on to be mathematicians. In many cases, my students will eventually forget how to differentiate $\sin x$ or the definition of a conformal mapping or the formula for n choose k . My aim is to shape their way of thinking about mathematics and about themselves. Some students are scared by the mere word “mathematics”, but it is my job to try to restore any confidence that they may have lost somewhere along the way and to encourage them to do their personal best. I want to challenge them, intrigue them, and show them the true beauty of mathematics. They *must* feel my excitement for mathematics and my personal interest in their success. When they do, the response I get is priceless.