

## Melody Molander's Teaching Statement

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In the right environment, any student can flourish in mathematics. I believe that every student in my classroom should feel respected and supported. Students come from different backgrounds, and I strive to provide all students with high-quality mathematics instruction in a space in which they all can grow into stronger mathematicians.

In that vein, I'm always endeavoring to become a stronger educator. At the University of California Santa Barbara, I attended workshops and fulfilled additional requirements for the Certificate in College and University Teaching and the Certificate in Inclusive Teaching. Additionally, I developed syllabi for classes of 60-100 students, provided feedback on exams to enhance student learning, assigned homework, wrote exams, and planned lessons. I also managed teaching assistants, teaching them to run effective sections and communicate equitably to a classroom with students who each have their own best learning method.

I am an instructor of record at the University of California, Santa Barbara where I have taught Linear Algebra and Vector Calculus. I was also an adjunct faculty member at Cosumnes River College where I taught Pre-Algebra, Arithmetic, and an Introduction to Statistics, Probability, and Excel course. Prior to this position, I was an instructor of record at the University of Oklahoma where I taught College Algebra and Calculus. At the University of California, Santa Barbara I have also been a teaching assistant for Abstract Algebra, (proof-based) Linear Algebra, Introduction to Proofs, Calculus, and Calculus for Social and Life Sciences. At the University of Oklahoma I was a teaching assistant for Calculus, Calculus for Business Majors, and Accelerated Calculus.

I have long been passionate about quality instruction. I have repeatedly received high marks on my teaching evaluations. In 2020, 52% of my Linear Algebra student survey respondents rated my teaching as "Excellent" (the highest rating). In 2021, 68% of the student respondents of my Vector Calculus class rated my overall quality of teaching as "Excellent". Both of these courses I was the instructor of record.

I strive to build a welcoming environment for the entire classroom. I encourage students to ask even "basic" questions by maintaining a relaxed classroom demeanor and being kind and understanding. I also make sure my students know that I'm available to them outside of class hours. *"I particularly appreciated how available and flexible the instructor was for students to contact, ask questions, and get help in their studies. The instructor's attitude was very positive and friendly which contributed to a very comfortable and welcoming learning environment,"* writes one student.

To support my students' general well-being, I like to invite a worker from the Food Security and Basic Needs program on campus to class to speak about navigating campus support programs. I don't know the situations my students are facing at home, and like to be accommodating when life is difficult. *"She was very considerate of the [COVID] situation and successfully made arrangements to help us learn such as creating a forum where we can ask for help from other students or her,"* one student writes. *"For tests she was also considerate of how we may encounter troubles during the test such as internet problems etc and gave us plenty of time during the test so we can notify her or the TAs of a problem."*

Unfortunately, there are substantial disparities in support services, treatment, and achievement, which are typically formed before the university-level. I aim to work to close the gap and create a more equitable and inclusive learning environment. As an undergraduate I volunteered at a Math Circle, which focused on increasing equitable access to joyful, rigorous, and relevant mathematics to middle and high school students. I wanted to continue my outreach efforts as a graduate student at the University of Oklahoma. With a professor at OU, I decided to start a Math Circle in Oklahoma. To obtain support and get the word out, we contacted the Director of Secondary Mathematics at the Oklahoma State Department of Education.

Around that time, a daily newspaper called The Oklahoman published an article titled "Oklahoma college students' poor math skills traced to teacher shortage" which stated *"more than one-third of freshmen at Oklahoma's public colleges and universities can't handle the mathematics courses because there are not enough good middle and high school math teachers to prepare them."* We then decided to make Okla-

homa's first Math Teacher's Circle. Our focus was to facilitate collaboration through shared resources and teaching strategies, as well as be a safe space for teachers to discuss their math questions and teaching concerns. The MTC also provided guidance that enabled teachers to promote teaching mathematics in a way that supports an equitable learning environment. After we successfully launched MTC, I volunteered to help facilitate discussion and lead group activities.

At the University of California, Santa Barbara I organized a Directed Reading Program where 80 undergraduate students were paired with 30 graduate students to gain exposure to and practice effectively communicating advanced mathematics. I taught and led discussions with groups of students on advanced mathematics topics such as Geometric Group Theory, Lie Algebras, Knot Theory, and Functional Analysis. Every week my students would read a section of the book, then we would discuss their questions and do example problems. When I mentored Knot Theory, I would bring in strings for my students to use as knots so that they could see through example the concepts they were learning. At the end of the year, my mentees would put some of their favorite concepts they learned on a poster and give a presentation. I would help them successfully convey mathematics to an audience of their peers. Two years in a row my students won Most Outstanding Poster Presentation for their excellent poster and ability to discuss the mathematics they learned throughout the year.

I believe my students can succeed, and because of that, they do. I like to use active learning, a technique that has been shown to promote inclusive and equitable learning as well as foster mathematical creativity. In particular, I commonly use pedagogical techniques such as "think-pair-share" and group work. I also give students opportunities during class time to think through how they themselves would solve a problem.

When lecturing, I believe in structuring class so that students not only get formal definitions, but also understand intuition, and how to apply the concepts to their needs. I first give a big picture overview of why they should care about the concept they will learn. Then I introduce the definitions and theorems, furnishing a plethora of ways to think about the concepts. I draw pictures on the board, and provide level-appropriate proofs, deeper-level insight, and worksheet problems that lead them to form their own conclusions based upon work done in previous problems. For example, when I teach about change-of-bases matrices in Linear Algebra, I like to draw the Euclidean plane, then the two vectors that define the new basis, then draw the new coordinate plane from those vectors. I use this picture to show how a vector originally defined by the standard basis can be defined in this new basis. This visualization helps students understand the idea behind the change-of-basis matrix formula.

After I present the relevant definitions and theorems, I like to give examples. I believe in starting with basic examples to give students confidence. Then we work through harder problems, understanding the power of the material they just learned.

I frequently pause my lecture to give students time to take in material and think about what their questions are. When I assign homework, I also believe in assigning problems of various levels. The easier problems at the beginning of the homework build the student's confidence and the harder problems build the student's intuition and understanding. Students tend to like this, writing: *"Although sometimes challenging, the homework was a good fit to advance my understanding, and I felt it was the perfect level of difficulty. Overall, Melody Molander was instrumental in my understanding!"*

I aim for my lectures to feel more like discussions. I ask questions with many answers and opportunities to discuss nuances. *"For each lesson, she clearly explained mathematical processes step-by-step in a manner that was easy to understand,"* a student writes. *"As a student who has difficulty with mathematics, I truly appreciate that she refrained from using technical jargon when unnecessary because it made it easier to grasp mathematical concepts."*

All students are capable of learning complicated and challenging mathematical concepts. My goal is to prove to future students that math can be useful, accessible, and fun.