

Teaching Statement

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Context Statement

I am a Ph.D. student in Mathematics at Duke University, where my research focuses on Quantum Error Correction. My path to pure mathematics was winding, beginning with an undergraduate major in experimental physics. This interdisciplinary background informs my teaching philosophy. My teaching experience is varied, including roles as a teaching assistant and discussion leader for several calculus, proofs, and topology courses. At Duke, I have taught multiple calculus classes and completed a semester-long course on teaching mathematics **(A5)**. Beyond the traditional classroom, I have designed and instructed programs for high school students **(A1)**, founded a Directed Reading Program (DRP) **(A4)**, and mentored numerous undergraduate research projects **(A4)**. My teaching is shaped by a commitment to making mathematics accessible through active, collaborative learning and a dedication to supporting and mentoring underrepresented students in STEM **(V1, V2)**.

Areas of Activity

1. Designing and Planning for Learning Activities (A1)

My approach to course design centers on creating engaging, accessible, and well-structured learning experiences. As the Program Supervisor and Instructor for the Summer Women in Mathematics program, I designed and taught an algebraic topology curriculum for over 80 eleventh-grade girls **(A1, V1)**. In that role, I also developed and supervised original student projects from inception to completion within a one-week timeframe **(A1)**. Similarly, as the Founder and Director of Duke's Incoming Student Bootcamp, I developed the entire program from scratch, including its curriculum, schedule, and budget **(A1)**. In my own classrooms, I plan for active engagement by incorporating review games before exams **(K1, V2)**. To ensure continuous learning, I design my courses to include short homework questions after every class. This structure helps students keep up with the material and allows me to see when they begin to fall behind **(K3)**.

2. Assessing and Giving Feedback for Learning (A3)

I view assessment as a vital part of the learning process rather than just a tool for evaluation. To provide students with continuous, low-stakes practice and feedback, I assign short homework questions after every class and administer quick, 5-minute weekly quizzes **(A3)**. These frequent assessments serve two purposes: they give students practice and provide real-time feedback on the class's progress **(K3)**. This method also helps alleviate the stress of grades by giving students opportunities to "make up" lost points, promoting equity of opportunity **(V2)**. My goal is to make assessment fair and transparent. Before exams, I use review games to allow students to test their understanding and identify areas that need more work. This formative approach helps turn assessment into a productive and supportive learning activity **(A3, V3)**.

3. Supporting and Guiding Learners (A4)

Mentorship is a cornerstone of my teaching practice. I initiated the Duke Directed Reading Program (DRP) to pair graduate mentors with undergraduates **(A4)**. As a mentor in the University of Chicago's summer REU, I held problem sessions for first-year students and worked intimately on interdisciplinary projects with

two students ***(A2, A4)***. I am committed to supporting underrepresented students; as a woman with documented disabilities from a minority ethnic group, I empathize with their challenges and aim to be an effective and relatable role model ***(V1)***. In the REU, I made it a point to talk one-on-one with students, openly sharing my own winding mathematical experiences ***(V1)***. To build community, I hold meetings in communal areas and offer extra credit for collaborative work to encourage students to form study groups ***(V5)***.

Integrate & Reflect

Three core values connect all aspects of my teaching: community, accessibility, and mentorship. I believe that mathematics should not be done in isolation, a principle I enact by fostering collaborative environments through group work and peer-to-peer programs like the DRP ***(V5)***. My teaching philosophy centers on making abstract concepts accessible and engaging for all students, regardless of their background ***(V1, V2)***. I achieve this by using interactive techniques like "think-share-pair," connecting material to interdisciplinary interests, and openly admitting my own past struggles to normalize the learning process ***(K1, K2)***. Finally, I am committed to mentorship that is inclusive and supportive, especially for women and minorities in STEM. I want students to leave my classroom not only with disciplinary knowledge but also with persistence, collaboration skills, and the confidence that they belong in STEM.

Looking Ahead

I am a reflective and forward-looking educator who sees teaching as an evolving practice ***(A5)***. In the future, I would like to design and teach new interdisciplinary courses that connect pure mathematics to my research interests and my background in neuroscience and physics. I plan to continue developing as a teacher by seeking opportunities to receive feedback to refine how I communicate with students ***(A5)***. A long-term goal is to connect my teaching and research with societal needs by organizing outreach and REU programs, particularly for students from lower socioeconomic families, women, and minorities ***(V4)***. By creating and leading such programs, I hope to open avenues for students to gain new experiences and to share the vast, interdisciplinary world of mathematics with the broader community.