Fernando Al Assal - Teaching statement

I have taught mathematics classes at a number of different levels and contexts, including introductory algebra to incarcerated students, hyperbolic geometry to high school students, and calculus to Yale undergraduates. I am happy when I can share my understanding of mathematics and help students appreciate its practical, playful and contemplative aspects.

I have taught calculus at Yale three times, and am teaching it for a fourth time this semester. I have taught both single- and multivariable calculus. In my classroom, you will see lecturing interspersed with polls, small group discussions, and longer group worksheet exercises (which can be as fun as board games). With these activities, students keep engaged, interact with each other, and struggle a bit with the material, which I think is a good way to learn and gain fluency with math.

At Yale, calculus is taught in multisection classes. My sections have ranged from less than ten to more than twenty students. The class is coordinated by a lecturer, who also writes the syllabus and homework. Every week, instructors from all sections meet to discuss how to teach the content, and, a few times a semester, to collectively design exams. Incorporating suggestions from more experienced instructors has been very helpful to me.

I also taught Introduction to College Mathematics via the Yale Prison Education Initiative in the spring of 2022, at the MacDougall-Walker Correctional Institution. I volunteered for this opportunity, as I believe the students would have a lot to gain from a math class. In general, they have had less opportunities in their lives to think deeply about logical puzzles and share their thoughts with others than my Yale students. The course, which is from the University of New Haven, starts with a review of arithmetic expressions, building up to topics such as exponential functions and applications and factoring algebraic expressions. I wrote my own syllabus (in line with the version taught on campus at UNH), as well as my own homework sets and exams. I was fortunate to teach an excellent and dedicated small group of students, some of whom really came to appreciate the beauty of the mathematics they learned.

Finally, I have also enjoyed teaching mathematics outside of the standard introductory college classes. In the summer of 2020, I taught an elementary introduction to hyperbolic geometry to high schoolers (mostly from Latin America). Many students were surprised and excited about what math could look like beyond what they were used to.

Since 2019, I have also organized the Yale Mathematics Directed Reading Program. This program pairs intermediate to advanced undergraduate students with graduate mentors to read a math textbook. Often, the book has content that is somewhat nonstandard in typical undergraduate

classes. I have mentored a project on stochastic processes five times and have matched students with mentors for many other projects in multiple areas of mathematics.

I was fortunate to participate in many professional development activities at Yale. All graduate students are required to take a teaching seminar in their second year, which is where I first learned about the importance of implementing active learning techniques to keep students engaged in the classroom. I am also in the process of completing an optional teaching certificate, which involved a attending an extra teaching seminar, as well as observing other classes and being observed myself. Last fall, for example, after having my class observed, I incorporated the suggestion to have more short small-group discussions interspersed in my lecture. This both livened up the atmosphere and made sure students engaged with subtle bits of material before I moved on.

To conclude, I am confident teaching mathematics at a number of different contexts and levels. I believe many people can benefit from engaging with mathematics, playing with its puzzles, contemplating its beauty and using it in their lives. As a teacher, I hope to keep facilitating such interactions for students of many backgrounds.