TEACHING STATEMENT

STEPHEN MCKEAN

I enjoy teaching mathematics at all levels, and I consider it an important part of my job as a mathematician. I have designed and taught courses at the high school, undergraduate, and graduate level, and I have also taught outreach courses for elementary school students. To me, the most rewarding part of teaching is helping students grow in their confidence and passion for math.

Awards and evaluations. At Georgia Tech, I received an award for having the highest student evaluations of any math department TA in 2019. At Duke, I won a Bass Instructional Fellowship for my proposed introductory proofs course for students in the humanities and arts, as well as the L.P. Smith Award for my long-term commitment to excellence in teaching. I am also completing Duke's Certificate in College Teaching program. My course evaluations are consistently excellent, with over 80% of responding students giving me the highest possible overall rating. Many of my students have commented that I have been their best professor (whether in math, STEM, or overall). Several students have said that my courses taught them to love math.

Course design. I am mindful about planning and structuring the courses I teach. While at Georgia Tech, I was assigned to teach a course on calculus in the life sciences at the undergraduate level, as well as a review course on abstract algebra at the graduate level. I separated the calculus course into three modules (dynamical systems, integration, and differential equations) and picked several topics in biology, chemistry, and neuroscience to fold into each of these modules. I based the abstract algebra course around problem solving and time management in order to help grad students prepare for their comprehensive exams. At Duke, I designed an introductory proofs course for students in the humanities and arts. This course to focuses heavily on the creative process in proof-writing, as well as on communicating in written form (using LaTeX) and oral form (using board talks).

Undergraduate teaching. Beyond calculus for life sciences and introductory proofs, I have been an instructor for differential calculus. I have also led discussions and held office hours for differential, integral, and multivariate calculus, and a course on linear algebra and differential equations. Outside of traditional classroom teaching, I have been an assistant for two undergraduate research projects (one REU, one project through Duke's DOmath program). I have led a few undergrads on reading projects through Twoples, an online mentoring program that I founded and organize. The topics for these reading projects have ranged from finite fields and cryptography to stable homotopy theory.

Graduate teaching. I actively seek out opportunities to improve my teaching and mentorship skills at the graduate level. As previously mentioned, I taught a course to help prepare grad students for the algebra comprehensive exam at Georgia Tech. At both Duke and Georgia Tech, I given invited talks at the TA training week for new grad students. At Duke, I helped organize the new grad student bootcamp in 2020 and have taught a workshop on website design for both the 2020 and 2021 iterations of this bootcamp. In two separate semesters, I was head TA for differential calculus at Georgia Tech. In this role, I prepared and gave weekly training for the other TAs (which included undergrads and grad students). As a part of Twoples, I hold monthly meetings to train grad student and postdoc volunteers on their mentoring practices.

K12 outreach. I view outreach as an important part of my teaching duties. In the summer before starting graduate school, I taught college prep courses on basic algebra, trigonometry, pre-calculus, and statistics through TRIO's Upward Bound program. While at Georgia Tech, I gave a lecture on topology and careers in math for the Gwinnett School of Math, Science, and Technology's 9^{th} grade speaker series and for SMASH Morehouse's networking night. In 2021, I helped run the newly-founded Durham Math Circle and was an instructor each week.