

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 middle school, 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. 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):

Stephen is easily the best professor at Georgia Tech that I have had. He made waking up for the class worth it since he was always so enthusiastic and clear about the material. If Stephen could teach all math courses at Georgia Tech, I would consider becoming a math major. He has high care and respect for all students, and he wants everyone to succeed.

— *Calculus for Life Sciences (instructor), 2019*

Stephen was the best TA I ever had. He explained everything impeccably and gave so many examples. He not only taught us what is right but why it was right and I really appreciated that.

— *Differential Calculus (TA), 2018*

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, which students appreciated.

Not too daunting. Concepts were carried throughout the chapters. LOVED the life sciences applications. Everyone is always complaining about wishing they would learn things that they'd actually use, and this was my first class -probably ever- to do that.

— *Calculus for Life Sciences (instructor), 2019*

Learning about the applications to biology. It made the class enjoyable and feel like material we would actually use in our careers one day. Usually I hate math classes because they are too much math and not enough applications, but this struck a perfect balance.

— *Calculus for Life Sciences (instructor), 2019*

At Duke, I designed and taught an [introductory proofs course](#) for students in the humanities and arts. This course focused heavily on the creative process in proof-writing, as well as on communicating in written form (using \LaTeX) and oral form (using board talks). I have also designed a two-week short course on abstract algebra and cryptography, which I taught to middle school students at Duke Pre-College in 2022 and to high school students at Harvard Pre-College in 2023. I am currently teaching a [graduate topics course on topological modular forms](#) and their connections to various branches of math. Regardless of the topic or level, I aim to structure all of my courses in a way that gives students a clear view of their path to success.

I thought that the reports and presentations really facilitate learning in the class and help students understand what they're learning in lecture and on homeworks. It is also just fun to see your classmates present and get better at it over time. We were able to do much more complex things at the end than the beginning which I believe is a sign of success. I would definitely encourage the course to be taught this way in future years. I liked the encouragement of participation and collaboration too as not all classes do that.

— *The Art of Proof (instructor)*, 2021

He was amazing and really sparked interest in the material. He set up the whole course before classes began so I always understood what was expected of me and what we had to do for the semester. The highly organized format he set up was SO SO helpful.

— *Calculus for Life Sciences (instructor)*, 2019

Focusing on students' needs. My primary goal is to challenge and support each of my students in their individual learning process. My students learn that mathematical thinking is both useful in their own fields and beautiful in its own right. My enthusiasm for the subject and for teaching in general sets this tone for my students.

I don't know where to begin. Stephen's lectures were engaging, thorough, and his enthusiasm was infectious, especially at 8 in the morning.

— *Calculus for Life Sciences (instructor)*, 2019

He radiates a passion for mathematics, teaching, knowledge, and curiosity. This made his lectures so enjoyable. Even when topics seemed boring, he made them fun.

— *Cryptography (instructor)*, 2023

Once this tone is set, my students are more willing to engage in the problem solving and group work that I integrate into my lectures.

Bless Stephen. He is the reason that I'm not failing Calc 2. Very clear and digestible recitations. Good structure. Especially liked forced group work because it made me like the people in my recitation and made me actually want to come to class.

— *Integral Calculus (TA)*, 2018

Stephen did a good job preparing questions for lectures and interacting with students; he often guided students, but always allowed students to make connections on their own. Fun and engaging!

— *Differential Equations and Linear Algebra (TA)*, 2020

By challenging students, I encourage them to actively participate and take ownership of their learning experience.

Stephen did a great job in creating tests that tested our knowledge but were not impossible. He did a great job of making sure we learned the material and understood it. The set up with homework one week followed by a quiz then another homework then a test was great! It really made me learn the material.

— *Calculus for Life Sciences (instructor)*, 2019

The homework questions were just difficult enough that they prompted us to think instead of following predetermined solutions in a textbook. It challenged us to utilize what we learned in the classroom to tackle many types of problems and strengthen our understanding of the concepts. I really enjoyed this novel way of learning.

— *Cryptography (instructor)*, 2023

Challenge alone is not sufficient for student success. I support my students by carefully preparing lectures, as well as offering as much time and attention in office hours as each student needs.

The in-class lectures were very important to learning. Professor McKean's explanations were essential to understanding the homework. He was also very available for help during his office hours, willing to explain difficult examples.

— *The Art of Proof (instructor)*, 2021

Stephen is hands down the best TA I've had at Tech. He clearly loves what he does and goes above and beyond what I expected of him. I would go to his office hours when my lab let out early, and he almost always stayed late, answering everyone's questions. Truly lucked out in having him as my TA. I would love to have him again.

— *Integral Calculus (TA)*, 2018

I heard this class was super hard, but I felt like there was plenty of support in place for us to do well.

— *Laboratory Calculus I (instructor)*, 2020

Stephen is a very approachable professor and I never felt uncomfortable asking for help and attended office hours every week. He is super willing to go out of his way to help his students, which is much appreciated.

— *Calculus for Life Sciences (instructor)*, 2019

The greatest mark of success for my teaching is the growth my students experience in their confidence and interest in math.

I think that the introduction of new and old ideas but then building on those ideas is the class' greatest source of intellectual stimulation. As a non-STEM major, I had to learn to think in new ways and approach assignments differently. I believe the class was successful in opening my mind.

— *The Art of Proof (instructor)*, 2021

To someone who was already a math nerd, this course somehow made me fall even deeper in love with the subject. The topics covered in this course [were] challenging and required many hours of work outside of class. However, I enjoyed every second of it despite the occasional frustration and late nighters that came with not being able to solve a hard problem.

— *Cryptography (instructor)*, 2023

The teacher's communication skills are excellent!!! I learned to love math even though I have hated it my entire life.

— *Calculus for Life Sciences (instructor)*, 2019

Stephen made me feel confident again in my math abilities. After taking Math 1551 last semester and struggling, I did not think I would ever do well in or understand another math class here at Georgia Tech. I am now ready to move on the my remaining math classes, and I am SO GLAD I took this class (even though it was an 8am every day). THANK YOU!!

— *Calculus for Life Sciences (instructor)*, 2019

Development and future goals. I continually work to improve my teaching skills by enrolling in pedagogy courses and workshops, and by soliciting feedback on my teaching from my students, peers, and mentors. While at Duke, I completed the [Certificate in College Teaching](#) program. During the next few years, I plan on applying for and participating in [Project NExT](#) to further my pedagogical training.

Beyond training, I will improve my teaching skills by seeking out diverse teaching experiences. This includes courses from standard undergraduate and graduate curricula and topics courses on subjects relevant to my research, but also outreach courses that introduce advanced topics to a broader audience. For example, I am interested in designing a course on knots and braids for students in the creative arts, a course on algebraic topology for scientists and engineers, and a survey of category theory in various contexts for math majors. Each combination of subject and target audience would provide unique challenges that would enable me to further strengthen my teaching skills, while also serving the mathematical community in a unique way.