

The audience of mathematics courses, particularly at the introductory level, is composed of diverse and sometimes reluctant learners. Given this audience, effective teaching communicates more than the course material by transmitting the beauty of mathematics. An elegant mathematical argument speaks to individual students as a function of their experience and interest level. Accordingly, these diverse interest levels ensure that effective teaching is an exercise in differentiated instruction. By tailoring my teaching approach to the interest and experience level of my audience, I foster an inclusive learning environment where each student receives the amount of instruction necessary to support their learning. In practice, I approach teaching as a conversation during which the students and I actively engage with the processes leading to mathematical results. This interactive approach exemplifies the reality that mathematics is an active process, offers individually guided practice in this skill, and includes a variety of student viewpoints in each class.

I implemented my teaching philosophy approach during my experience as a teaching assistant for integral calculus at McGill University. I was responsible for 2 tutorials and 3 office hours per week. I began each tutorial with a brief review of the material to be covered and divided the exercises for each topic into three sections. For the first, I detailed a complete solution while explicitly describing my thought processes emphasizing how and why I was applying each concept. Next, by soliciting student input, we completed a second problem on the board. I found that students were encouraged to make suggestions during this second example after I explicitly verbalized my thoughts during the first section. Finally, I allowed students time to work through a new problem while I circulated through the class and offered individualized instruction. By scaffolding each topic in this way, students first observed the steps leading to a complete solution, contributed to the development of a solution, and finally independently solved problems with my differentiated guidance. Students appreciated this course design and made explicit mention of it in my teaching evaluations.

Integral calculus is required for most McGill science degrees so the audience enters with varied academic backgrounds and interests. To connect and engage with these students, I used a range of individualized approaches. My ability to do so was recognized with the Teaching Assistant Award in 2017 and 2018 while my calculus students gave me an average rating of 4.9/5 for “Overall, the performance of this TA was excellent” with no ratings lower than 4/5. I also lectured portions of third-year *Honours Ordinary Differential Equations* and *Honours Introduction to Dynamical Systems* courses at McGill. While these courses required more direct lecturing than a tutorial, I explicitly structured each class to emphasize student interaction and participation; the students quickly learned that their participation is a crucial aspect of the course and of their learning.

My postdoctoral and industrial experience is focused on research with no teaching opportunities. However, teaching is an integral part of being a mathematician that I have dearly missed. Therefore, I searched for opportunities to teach during my postdoctoral experience and organized a day-long workshop as part of the CRM-CAMBAM Mini-workshop series. The workshop offered a graduate-level introduction to the use of structured equations in mathematical biology and was attended by approximately 60 participants. This online workshop illustrated the difficulty in eliciting student participation and the importance of adaptability during remote learning. As a result, I envision moving away from the synchronous lecture format for remote learning, and instead pre-recording lectures and scheduling small virtual meetings to allow for personalized feedback.

Mathematical teaching also includes student mentorship and I have thus far mentored three undergraduate researchers. In an interdisciplinary field such as mathematical biology, fostering an interactive and collaborative atmosphere through frequent (at least weekly) meetings is critical. During these meetings, I emphasize the collaborative nature of mentorship, with students learning to pose research questions and take initiative in their work. As a mentor and scientist, I am deeply committed to issues of diversity, equity, and inclusion. I am committed to the recruitment of undergraduate researchers from under-represented groups, such as women or people of colour; to the creation of an inclusive, supportive and respectful group atmosphere; and to explicitly seeking opportunities to listen and learn about issues of diversity, equity, and inclusion. I am dedicated to taking concrete action to ensure that all students view mathematics as a place they are welcome, where they belong, and where they are important contributors.