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**Teaching Statement**  
2016–10–26

**Overview.** As an educator, my mission is to enable all my students to understand and appreciate the utility and beauty of mathematics, and it is my responsibility to create a respectful, professional, and welcoming learning environment. A solid education in mathematics not only gives students a breadth of experience in techniques of mathematics and related sciences, but more generally develops their ability to think logically, encourages collaboration, and fosters genuine curiosity about the patterns in the world around us. To accomplish these goals, I use traditional and modern teaching methods. My favourite methods include chalk-and-slate lectures, cooperative learning and coached problem sessions, and online forum discussions. Lecturing is important because it gives large numbers of students the opportunity to see how an expert navigates the subject. I like to write my notes on a board because the process is slow and focused, allowing students to formulate questions as I lecture, and letting me recreate the problem-solving process and make adjustments or even mistakes. Cooperative learning and coached problem sessions are excellent ways to absorb new material—I have enjoyed these from the teacher’s and the student’s perspective. I believe that homework should involve cooperation, serve to reinforce ideas, expand on lecture topics, and provide valuable assessment. Mathematics is a communal endeavour, and students should learn this early on in their studies. Online discussions are effective ways to disseminate knowledge at a distance, and they allow a freedom to ask questions and make mistakes not always available to all students in social settings, similar to the use of clickers during lectures. Moreover, forums give students ample opportunity to ponder and answer their peers’ questions, and to post on their own schedule. I believe that fair evaluation is a necessary aspect of certifying learning progress, and I make my expectations clear at the beginning of the term. This allows students to focus their energy and to avoid becoming overwhelmed. My mathematical research also informs my teaching, as I want my students to develop many of the tools that I need to do research—to be creative, to think carefully, to seek connections, to engage each other, to not fear failure, and to work diligently. Let me highlight some of the recent experiences I have had while teaching.

**Intermediate Linear Algebra.** I taught linear algebra in Winter 2016, covering basics of linear algebra through to important decomposition theorems; enrollment was 79 students. This course serves multiple purposes—the main audience is Queen’s applied math students who need a strong foundation for PDEs and engineering applications, but this course is also an introduction to mathematical rigour, proofs, and theory-building for pure mathematics students. I balanced these needs by presenting many examples motivated by PDEs, and giving detailed proofs. I gave traditional chalk lectures, and with my TA, I organized weekly tutorial sessions, which functioned as expert-led problem solving and collaboration sessions. Each week, I suggested textbook problems for the students to solve in small groups at the tutorials. These problems were more routine than the homework, which aimed to develop depth of understanding. I encouraged students to collaborate on both suggested and homework exercises, and to ask me and the TA for help—tutorials were punctuated by mini-lectures to clarify concepts. Each student submitted homework individually. Reflect-

ing on my undergraduate experience, much of my success was derived from collaboration and competition with my friends, and my idea for the tutorials was to enable those interactions, with the support of an expert. The tutorials were well-attended throughout the term. A challenge I faced was interacting with students who had not engaged with the class. My general approach was to try to open communication with them, to ask how they envisioned being successful in the class, and to give practical advice from my personal experience. I would be more proactive in seeking these students out next time, as some of them had personal difficulties, but were able to succeed after they contacted me, and we discussed things and made adjustments.

**Queen's Distance Courses.** I instructed an online ODEs course in Summer 2016, and a Calculus course in Summer 2015; enrollments were 85 and 180 students, respectively. The video lectures were previously designed, so my duties were to guide students through the material, to redesign a modelling assignment, to troubleshoot online problems, and to respond to students' concerns. One challenge with online courses is fostering connections among students. Two concrete ways we did this were with online forums and peer-reviewed modelling assignments. Initially, students were reluctant to use the forums. My approach to increase participation started by taking mathematical questions from my inbox, and posting them with answers under my name on the forums. I made it clear that asking and answering questions on the forums were valuable contributions that would count towards participation grades. Students then began using the forums more regularly, especially as the material became more difficult. For the peer-reviews each student submitted a draft report on the modelling problem, the students gave feedback on two drafts and received feedback on their own, and finally, the students submitted their final draft, incorporating feedback. This helped to improve reports, and to initiate conversation and collaboration. However, next time I would implement a buffer stage, to flag non-genuine first drafts. Everyone could submit a final draft, but students who missed the peer-review deadline expressed disappointment, meaning that they do value these collaborations.

Significant online administration was necessary—webwork was submitted weekly, as were concept check-ins, while there were biweekly term tests and a final exam. Special scheduling requests were frequent, and it was necessary to accommodate students' summer plans. This involved rescheduling and course maintenance through the Moodle course software. I took pains to advise students on the work needed to catch up, as many students underestimate the time commitment required in summer courses. With the help of Queen's IT specialists, I also organized real-time audio and tablet PC tutorials as final exam preparation sessions.

**Calculus Workshops.** A formative experience at UBC was facilitating calculus tutorials organized by CWSEI, whose goal is to improve pedagogical outcomes by applying the scientific method. The tutorials ran like labs, with small groups working together through sequences of problems at chalkboards. The group dynamic encourages early engagement with topics and allows all members to simultaneously contribute and identify weak points in their knowledge. I buzzed around the groups, gauging progress, encouraging cooperation, and giving hints for the correct next step. I occasionally encountered students who avoided participation; my approach is to encourage them to join the group, and to prod them with easier mathematical questions—this often prompts them to participate.

I look forward to sharing my passion for mathematics and to developing as a teacher.