Teaching Statement

Kyle Hambrook

Average Evaluation Score

Official - **4.0/5**

RateMyProfessors - **4.6/5**

Teaching Experience: Courses Taught

- Department of Mathematics, University of Rochester (UR)
  - Fall 2017: MTH 161 Calculus IA (Head Instructor and Workshop Coordinator); MTH 210 Introduction to Financial Mathematics; MTH 391W Portfolio Management (Independent Study)
  - Fall 2016: MTH 142 Calculus II; MTH 210 Introduction to Financial Mathematics
  - Fall 2015: MTH 161 Calculus IA; MTH 201 Introduction to Probability
- Department of Mathematics, University of British Columbia (UBC)
  - Spring 2015: MATH 152 Linear Systems
  - Fall 2014: MATH 104 Differential Calculus with Applications to Commerce and Social Sciences
  - Spring 2013: MATH 105 Integral Calculus with Applications to Commerce and Social Sciences
  - Spring 2011: MATH 101 Integral Calculus with Applications to Physical Sciences and Engineering

Teaching Experience: Other Activities

- Workshop Coordinator for MTH 161 Calculus IA, UR (Sep - Dec 2017)
  Description: Design workshops; run weekly training and coordination meeting with TAs.
- Course Development for MTH 210 Introduction to Financial Mathematics, UR (Sep - Dec 2016)
  Description: Complete redesign (at request of UR Simon Business School.) Found new textbook, LaTeX-ed complete lecture notes with additional examples and explanations beyond textbook, wrote all new homework assignments. This material will be basis for course in future. Lecture notes intended eventually to be published as short textbook. Latest course and notes: `https://web.math.rochester.edu/courses/current/210/`
- Head TA of Math Learning Centre, UBC (Jan - Dec 2012)
  Description: Managing the Math Learning Centre, which includes training, scheduling, and managing the approximately 50 teaching assistants who staff it each term.
- Teaching Assistant, Department of Mathematics, UBC (Sep 2009 - Aug 2015, except when instructor)
  Description: Activities include workshop facilitation, tutoring, marking, and exam invigilation.

Teaching Dossier

`https://web.math.rochester.edu/people/faculty/khambroo/teaching/dossier`
Includes course evaluations, evidence of teaching effectiveness, sample syllabi, and other documents.

Teaching Philosophy

Teaching is arguably the most valuable thing I do as a mathematician. Unless I prove the Riemann Hypothesis (or something on that level), my very best paper may only reach a few hundred experts. However, teaching a single class in differential calculus influences the ways in which a hundred or more people think about mathematics for their entire lives. I therefore think deeply and carefully about my teaching.

My role as a teacher is to support my students' learning process. The choices I make in teaching reflect this viewpoint.

In class, I focus on building a strong foundation of basic techniques and knowledge. I choose examples for class with this focus in mind. I demonstrate how to apply the basic techniques and knowledge to solve reasonably uncomplicated problems. The most complex problems I expect students to handle are encountered during their practice, with guidance and encouragement from me as necessary. Without a firm grasp

of the basics, students will be hopelessly ill-equipped to tackle more complex concepts and problems in the present course, in future courses, and in their lives.

I regard math class as a setting for play. Not frivolous play, but the type of play that's really rehearsal for the real thing. The type of play that wolf pups engage in. I reject the notion that examples must always be "real" and reflect the complexity students encounter in the hardest cases. I say math class is for play. This idea of math class as play fits with my own view as math as a form of intellectual play. It also serves to empower and encourage students to tackle problems that are more challenging than they've encountered before.

I also build in ample time for questions during class (from students to me, and from me to students), so that I can verify that students understand the fundamentals and try to correct misconceptions before they become entrenched.

The way I conduct my classes supports what researchers have identified as the early stages of the learning process: Students begin by acquiring a set of component skills and knowledge, and they need demonstrations and practice to begin integrating these components.

I believe learning mathematics (like most things) requires substantial practice. Students need to practice applying the techniques and knowledge they acquire to develop fluency. Students also need practice to develop the experience necessary to understand how they can apply what they know to solve new problems. For my students, this practice comes through homework, quizzes, and studying for exams. I want my students' practice to be efficient, so when I set practice tasks, I think carefully about targeting specific concepts and skills, and providing an appropriate level of challenge.

I have found practice is most effective when it is coupled with timely, targeted feedback. I give one-on-one feedback to students when they talk to me outside of class about their homework or exams. I never let students escape with just the "right answer"; I prompt them to see and then correct their mistakes. Giving feedback on student practice prevents misunderstandings of techniques and concepts from becoming entrenched. It also guides future practice so that students prioritize practicing the skills that most need improvement. In turn, post-feedback practice helps students incorporate the feedback into their mental framework and processes. Practice and feedback actually complement and reinforce each other in a cycle. One way I try to foster this cycle is through quizzes (which I make part of my courses whenever I have sufficient autonomy). If students write a quiz on Monday, it is returned to them promptly with feedback on Wednesday, so that they can reflect on the feedback while the concepts are still fresh. The quiz is then reviewed in class on Friday with time for students to ask any questions that the feedback and reflection have inspired. If there are certain concepts or skills that need particular improvement, students are informed those concepts and skills will be tested on the next quiz and therefore should be practiced.

I also support my students learning through the environment I create. The most valuable teaching opportunities occur during one-on-one interactions where I can engage in customized, in-depth guidance and discussion. To encourage such interactions, I am approachable and available to my students. I also make my classroom a place where students feel comfortable engaging with mathematics and asking questions.

Everything I do as a teacher is carefully designed and considered in order to support my students' learning process.