

Brian Lins

Teaching Statement

I had my first teaching experience in high school when I worked as a math and science tutor for a local tutoring company. Although hesitant at first, I quickly discovered that I found the challenge of teaching exciting. After each session, I would mentally review what I had said, looking for better ways to present an idea or give a useful hint. I enjoyed working with other students and I was encouraged when they seemed to find my guidance helpful. I knew then that I wanted to become a teacher.

My experience as a tutor convinced me to become a teacher and my time as a graduate student at Rutgers University reinforced that decision. While at Rutgers I had the opportunity to teach several classes, both as a teaching assistant and as an instructor. I also served as a head TA during several semesters. As a head TA, I worked as a liaison between the faculty and the graduate student TAs, helped coordinate the WebWorks software package used for on-line calculus homework submission, and also observed and advised new TAs on their teaching. Peer evaluation provides an opportunity for graduate students to get teaching feedback in a pressure free environment. In preparation for this role, I attended training sessions run by the Rutgers TA project to learn how to offer useful teaching advice. In the spring of 2004, I was recognized by the Rutgers math department with a TA teaching excellence award. In 2007, I was hired by Dickinson College to teach for one year as a visiting assistant professor.

When I prepare for a lecture, I decide ahead of time what topics to focus on and typically write down everything I hope to say, including working out the examples. I try to choose examples that are interesting, counter-intuitive, or just plain fun. When possible I like to include historical anecdotes and intuition building digressions. In a lecture on sequences and series, I love to tell the story of how a young Gauss calculated the sum of an arithmetic series. I have found that there are many great resources for ancillary teaching materials, including popular books on math, calculus textbooks, and the American Mathematical Monthly.

I feel that it is important for interested undergraduates to be exposed to teachers who are experts in their field. At the same time, most students I have taught are not planning to study math for the rest of their lives. I try hard to make my teaching accessible to everyone, while giving those students who are most interested the opportunity to learn more. For example, when I taught Advanced Math for Engineers I used a 15 minute break mid-lecture to give my students a challenge problem. The problems were harder than the homework and most dealt with real-world applications. Occasionally, I used the problems to introduce ideas that I did not have time to include in the lecture. Although I did not grade the problems, the students took them seriously and seemed to appreciate the chance to try real applications.

The Advanced Math for Engineers course at Rutgers is a senior level course with highly motivated students. I have found that students taking introductory calculus are not always as focused or as interested in the material. Many first year students also do not understand how to study mathematics or the importance of practice problems. In a sequential subject like calculus, it is crucial to convince these students to keep up with the material as it

appears. In my first year calculus class at Dickinson I give a weekly quiz based on the homework. I allow the students to bring their written homework and use it during the quiz. In a typical quiz, the students must copy two solutions from their homework. They must also solve one new problem which is similar to the ones from the homework. This approach seems to work well because the students must focus on mastering new material every week. The quizzes also provide a weekly update for both me and my students on how well they are learning the concepts from the course.

Having taught several different versions of calculus, I have found that there is flexibility in the syllabus to tailor the course for the intended audience. In my courses at Dickinson, a liberal arts college, there is more freedom to explore the history and theory of the subject, whereas the same course for engineering students at Rutgers necessarily focused more on problem solving and applications.

I have taught several courses that include a lab or workshop period. During this period, students work together to solve detailed problems or reconstruct concepts from basic principles. For example, in one calculus lab my students had to demonstrate that every odd degree polynomial has a real root. The lab period also gives students the chance to use technology in the classroom. In my calculus labs, I have covered graphing calculator use and also introduced the Maple software package. When I taught multivariable calculus I developed more detailed Maple labs for the students.

It is important that my students know I want to help them. I like to remind my students that I work for them. I also want my students to do well in my class and to enjoy, or at least appreciate, the subject matter. As someone who was reluctant to approach professors in college, I understand that some students might hesitate before asking for help. For me to hold office hours is not enough; I try to actively encourage students to come and get help when they need it. I also make sure that all of my courses have a detailed web page with information about the homework, lectures, and exams for my students.

Teachers can have a tremendous impact on their students, sometimes in very direct ways. One teacher who influenced the direction of my life asked me to take part in a Research Experiences for Undergraduates project. At the time, I was unaware of the program. If one of my professors had not taken a personal interest in me, I might have missed the opportunity. I try to remember those times when teacher recognition had a great influence on my life, and I am mindful that I have a responsibility to nurture talent in my own students.

In the years since my first teaching experiences I have come to love teaching more and more. At the end of a day spent teaching, I still come home invigorated. When I am teaching I have the chance to review the beautiful concepts of mathematics and I am constantly finding new and amazing things. The best part of teaching arises when I know that one of my students has just caught a glimpse of the fundamental elegance and surprising power of mathematics.