TEACHING STATEMENT

ALLAN YASHINSKI

I have been teaching mathematics courses as an instructor since the summer of 2008. I have had the opportunity to teach a wide variety of mathematics courses including low-level courses, the entire calculus sequence, linear algebra, differential equations, an “introduction to proofs” bridge course, and a two-semester sequence in abstract algebra. I genuinely enjoy teaching, both for the joy of sharing mathematics with others, and for the opportunity to revisit old material and enhance my own understanding. I am confident in my ability to teach a variety of undergraduate courses, notably in areas of pure mathematics such as analysis, algebra, and topology. I believe I have been quite successful as a teacher, as evidenced by my positive student evaluations as well as many unsolicited compliments I’ve received from students. I have also received a teaching award and I have been nominated for two others.

Teaching Philosophy

In my view, the two main aspects of mathematics education are conceptual understanding and mastering practical problem-solving skills. Neither of these can be the sole focus in an effective mathematics course. My aim as a teacher is to strike the right balance between the two.

I believe a strong conceptual understanding is absolutely necessary for success in an undergraduate mathematics course. Many of the most beautiful ideas in mathematics are simple at their core, or are built upon previous ideas in simple ways. One of the goals of my teaching is to expose this simplicity to my students, to both increase their conceptual understanding and decrease the intimidation factor of mathematics. A fundamental issue is that the beauty of mathematics is often at odds with its rigor. To a mathematician, the ultimate understanding of a mathematical result is typically delivered by a mathematical proof. But students, especially first or second year non-math majors, generally do not think like mathematicians, and thus are not necessarily equipped to handle such things. My job is to distill these ideas down to their essence and explain them in as simple of terms as possible. Very often, a well-drawn picture or a brief translation of mathematical language into “layman’s terms” is the most effective way to communicate a mathematical idea.

In a typical first or second year mathematics course, there are a number of skills that students are expected to learn. It is my opinion that students generally learn mathematics best through example. Thus after introducing any new concepts, the majority of time in my classroom is usually spent working through as many examples as possible. I carefully choose my examples to have enough variety so that the students can distinguish the features that are common to all from the features that are specific to a particular example. When developing new mathematical techniques in class, I often present the material as though we, as a class, are discovering it together. Typically, I will introduce a new type of problem to solve, explain any issues that prevent previous methods from applying, suggest a new approach to the problem, and then carry it out to its logical conclusion. I believe this approach not only engages the students, but empowers them by making them part of the mathematical process rather than merely spectators who are being told how to do things.

These two sides of mathematics education persist in higher-level courses, though in slightly different guises. In an advanced proof-oriented course, conceptual understanding is paramount. Here, the precise meanings of definitions and statements of theorems leave no room for ambiguity. As a consequence of the increased level of rigor, key concepts and ideas can be obscured. My approach
remains the same here: to explain in a less-formal, intuition-based way the ideas behind the technical apparatus. This strengthens the student’s understanding of the concept, but also develops the student’s ability to translate between intuition-based ideas and rigorous mathematics. The latter is an invaluable skill for the student to acquire. On the other hand, students in these courses need to get comfortable dealing with the “nuts and bolts” of higher mathematics. This comprises the practical skills-learning part of the course, which is often focused on writing proofs. As with more elementary mathematics, I believe that learning how to work with new definitions and apply new theorems is best learned through example. In addition to presenting proofs of the major theorems in class, I believe it is also important to work through some actual exercises with the students, so that they can learn how to approach problems involving the new concepts.

In general, the conceptual and problem-solving aspects of mathematics complement each other. Indeed, a strong conceptual understanding makes the methods for solving problems seem more natural, and thus easier to absorb. Without this understanding, students can tend to view these methods as mysterious algorithms which they must memorize. The more skilled of these students may still be able to solve these problems, but the process becomes meaningless and is unlikely to be retained after the course ends. A strong amount of experience in problem-solving also builds a conceptual understanding. Seeing and working through a variety of different examples enhances the mental picture that one has of an abstract concept. Thus, my goal is to emphasize both sides of mathematics as clearly and concisely as possible, so that I maximize the student’s potential for success.

**Teaching Experience as Instructor**

- Fall 2015 – Math 302, *Introduction to Differential Equations I*, one section (3 credits), University of Hawaii at Manoa
- Fall 2015 – Math 242, *Calculus II*, one section (4 credits), University of Hawaii at Manoa
- Spring 2015 – Math 413, *Introduction to Abstract Algebra II*, one section (3 credits), University of Hawaii at Manoa
- Spring 2015 – Math 253A, *Accelerated Calculus III (Honors Program)*, one section (4 credits), University of Hawaii at Manoa
- Fall 2014 – Math 412, *Introduction to Abstract Algebra I*, one section (3 credits), University of Hawaii at Manoa
- Fall 2014 – Math 241, *Calculus I*, one section (4 credits), University of Hawaii at Manoa
- Spring 2014 – Math 242, *Calculus II*, two section (8 credits), University of Hawaii at Manoa
- Fall 2013 – Math 321, *Introduction to Advanced Mathematics*, one section (3 credits), University of Hawaii at Manoa
- Fall 2013 – Math 241, *Calculus I*, one section (4 credits), University of Hawaii at Manoa
- Fall 2012 – Math 141, *Calculus with Analytic Geometry II*, two sections (8 credits), Penn State University
- Spring 2012 – Math 251, *Ordinary and Partial Differential Equations*, one section (4 credits), Penn State University
- Fall 2010 – Math 230, *Calculus and Vector Analysis*, one section (4 credits), Penn State University
- Spring 2010 – Math 017, *Finite Mathematics*, three sections (9 credits), Penn State University
- Fall 2009 – Math 250, *Ordinary Differential Equations*, one section (3 credits), Penn State University
- Summer 2009 – Math 220, *Matrices*, two sections (4 credits), Penn State University
- Fall 2008 – Math 230, *Calculus and Vector Analysis*, two sections (8 credits), Penn State University
- Summer 2008 – Math 022, *College Algebra II*, one section (3 credits), Penn State University
Teaching Experience as Course Assistant

- Fall 2011 – Math 497C (MASS Program), *From Euclid to Alexandrov; a guided tour*, I served as a teaching assistant to Prof. Anton Petrunin for the Mathematics Advanced Study Semesters (MASS) program at Penn State, a mathematics program for advanced undergraduates. Duties included running a weekly one hour recitation session, editing course lecture notes, holding office hours in which I helped students work through homework problems and their course projects, and grading homework.

Teaching Awards and Honors

- Fall 2015 – Nominated for Excellence in Teaching Award, University of Hawaii at Manoa, College of Natural Sciences.
- Fall 2012 – Nominated for Harold F. Martin Graduate Assistant Outstanding Teaching Award, Penn State University. I did not receive this award.
- Fall 2009 – Received Departmental Teaching Award for Graduate Assistants, Penn State University, Mathematics Department.