

Teaching Statement

Aaron Wootton

Experience

When one of my Freshman finally understands the Law of Cosines in a Trigonometry class or a Senior makes sense of the Galois Correspondence for a research project, I enjoy one of the most satisfying experiences that an instructor can have. For this reason, I have thoroughly enjoyed my time over the last seven years as an instructor at the University of Arizona and why teaching mathematics is an integral part of my career. The classes I have taught range from entry level courses such as **Trigonometry** and **College Algebra** to more advanced courses such as **Linear Algebra** and **Vector Calculus**. Please refer to my CV for a complete list of the classes I have taught.

As the instructor of a class, I rely upon individual contact with students. This includes having convenient and ample office hours as well as regular appointments with struggling students. For example, after a student had failed the first two of four tests, I suggested we have daily meetings to discuss the material we covered in class and any homework problems until he started feeling more comfortable with the class. We met every day for the rest of the semester and the student attained a “B” in the class with a score of 99% on the final exam. I maintain an open door policy making as much time available to my students as possible and I even encourage students to stop by my office if they are having problems in any future math classes. The success of this policy is reflected through the gratitude of my students and the general improvement in their understanding of the class.

I have found it beneficial for students to present solutions to problems on the board. Toward the end of the semester, I hand out review packets for the final exam. From this package, I assign small groups of students a number of problems which they work on and write up. During the last few class periods, I have them present problems on the board. I grade them on presentation, board work, communication skills as well as the correctness of the answer. I think it is becoming increasingly important to develop students skills in communicating ideas as the modern business world relies so heavily on presentations.

Besides regular academic duties, there are a number of other educational projects in which I partake. Since becoming a visiting faculty member at the in August of 2004, I have had the opportunity to guide undergraduate students in research projects as part of the department’s NSF VIGRE grant. Currently I have two students working with me, one is a project on using finite groups to

construct Cryptosystems, and the other is studying the problem of determining primality of a number. I assisted them in picking a research project which is suited to their mathematical abilities and interests, and now we meet regularly to discuss their progress and work out any problems they are having with the project. At the end of the semester, the student is required to write a detailed account of the project and what they have learned from it. I am very eager to continue such work in the future as it gives the students both an opportunity to learn mathematics outside of the classroom and to apply the skills they have learned inside the classroom to everyday problems.

I have recently become involved in the development of undergraduate texts in mathematics, specifically the new edition of the Calculus sequence of text books written by Hughes-Hallett/Gleason/McCallum et. al. As well as learning the skills required to write textbooks, this experience would also be very useful in the development of curricula.

I believe that outreach programs are vital for a department to become an integral part of the community by addressing its needs. For example, in May 2003, I organized a trip to Mary Welty Elementary School in Nogales, Arizona, where I spent a morning teaching a 3rd grade class of children about mathematics and its uses in the world. During my visit, I spoke with some of the teachers and they expressed their concerns about how many Hispanic students, especially in border towns, underachieve in academics. I intend to take a part in any outreach programs in the future, for example organizing regular trips for instructors to visit schools or to arrange for children to come to the University.

I have developed a wealth of teaching experience from young children to graduate level students. I have also developed the ability to lead undergraduate research projects and am currently learning skills which will help me to help develop curricula and write math texts. I would also like to become involved in any outreach programs a department may be running. These credentials coupled with my enthusiasm in teaching will make me a valuable addition to your mathematics department.

Philosophy

It is my belief that in academia, anyone can accomplish anything provided they have the **desire**, the **confidence**, and the necessary **assistance**. As instructors, we provide the necessary assistance a student needs in order to build the desire and confidence to succeed.

To fuel the desire of a student, I think the most important thing is to point out exactly where and why the material I am teaching is useful and relevant. I achieve this through a number of different steps. First, at the beginning of every semester, I try to determine the interests of the people to which I am

lecturing. A general idea is provided to me through the class roster by studying the different majors my students are employing. I feel however that I gain a more thorough understanding through personal contact. For this reason, I try to meet at least once with every student individually throughout the semester to determine each of their interests and how they they relate to the class. This knowledge gives me the opportunity to present examples from each persons field highlighting exactly why the material I am teaching is relevant and useful to them. I feel this has generally improved the attitude of my students. One particular case I recall is when a medical student explained to me that he couldn't understand why he had to take Calculus. The next class, I presented an example in which a medic had to calculate the concentration of a drug in the blood stream of a patient being administered through an intravenous drip to make sure the levels were safe. The solution required solving a differential equation and calculating an integral.

As an instructor, one of the most challenging things is to overcome the lack of confidence some students have in their mathematical abilities. I have found that personal contact time can be used to alleviate these feelings. During meetings with students, I encourage them to present solutions to problems on the chalk board, or ask them to explain concepts to me which were taught throughout class. By explaining each step in detail, they find their misunderstanding, and make the appropriate adjustments to arrive at the correct conclusion. The important thing however is that **they** arrived at the correct conclusion themselves. The result, I believe, is a more thorough understanding of the material and therefore an increase in confidence in their mathematical abilities. The success I feel is reflected in the students new confidence in presenting problems in front of the class.

I have developed this philosophy toward teaching since becoming an instructor. The success I think is reflected in the gratitude of the students I have taught. I am also encouraged by the fact that many students have followed me through a number of courses because they enjoy my method of teaching. Some of my students have even decided to pursue a minor or major in mathematics as a direct consequence of my teaching. My teaching style has even earned me an award from the University of Arizona learning disabilities department and nominations from other departments. Therefore, I feel by following this philosophy, I will continue to make a valuable contribution to educating students in mathematics.