

TEACHING STATEMENT

DENNIS EICHHORN

Teaching Awards and Honors:

- On the University of Illinois *List of Teachers Rated as Excellent by Their Students* for five semesters (out of six possible).
- Math Department Instructional Award, University of Illinois, Spring 1998.
- College of Liberal Arts and Sciences Award for Excellence in Undergraduate Teaching for Graduate Teaching Assistants (\$2000), University of Illinois, Spring 1999.
- Campus Award for Excellence in Undergraduate Teaching (\$3500 plus \$1000 salary increase), University of Illinois, Spring 1999.
- Selfridge Prize for Excellence in Mathematics Presentation, Spring 2005.

Philosophy:

The one secret that unlocks the door to excellent teaching is the fact that there is no one secret that unlocks the door to excellent teaching. Instead, excellent teaching occurs only as a result of excellent performance in each aspect of effective instruction. If there is one unifying concept to my elaborate philosophy of effective teaching, it is the notion that the education of a classroom full of individual students requires an assertive, omnidirectional approach to teaching, along with an unrelenting attentiveness to *each* of the myriad facets of excellent lecturing and properly running a course. In what follows, I will try to exemplify the abundance of these aspects of effective instruction.

When I say that teaching “requires an assertive, omnidirectional approach,” I mean that a successful educator must be aware that learning happens in many different ways, and thus a thorough teacher must learn to utilize each of the various vehicles for learning. For example, some students learn best by hearing, some learn best by reading, and some learn best by seeing pictures. By being sure to verbalize, write, and illustrate key points, an instructor can go a long way towards reaching all of the students. It is this sort of attempt to address issues from many different angles that produces successful education. Other examples of this “omnidirectional approach” include: providing examples ranging from specific to general; providing rigid algorithms in some instances, and giving problem-solving heuristics in others; conducting large review sessions and still being available to meet with individual students during office hours; teaching the matter at hand as well as the bigger picture into which it fits; being certain that students can understand problems in class and solve problems at home; and trying to teach abstract concepts while providing concrete, real-world applications. Teaching well is like packing the perfect snowball; the key to success is applying pressure from all directions.

To truly lecture excellently, there are countless things that an instructor must pay attention to. Among the many procedures and skills that are essential to excellent lecturing

are: knowing and understanding the students, including their motivations, abilities, likes, dislikes, backgrounds, and attention spans; preparing thoroughly for class; using meaningful examples; recapitulating previously learned material that connects to information in the current lecture, and foreshadowing relevant material that will be learned in the future; being energetic; showing enthusiasm for the subject at hand; asking questions; getting the class participated in lectures; using positive reinforcement when students answer questions in class (even when they answer incorrectly); carefully choosing words so as to give the explanations with the greatest possible clarity; providing a larger framework in which the students can hold the information and techniques being taught; providing convenient ways for remembering exceptionally important information and techniques (such as mnemonic devices, bullet points, and pictograms); teaching students not only what to do, but how to think in a way that will allow them to solve any problems that they may encounter (either inside or outside class); and attending to the traditional fundamentals of public speaking (e.g., maintaining eye contact, dressing appropriately, writing and speaking clearly, etc.). Mastering each of these skills is a good step towards masterful lecturing.

Although the majority of the tasks necessary to properly run a course are quite easy to perform, understanding exactly what these tasks are seems to be elusive to many instructors. Among the things necessary to properly run a course are: choosing office hours so that each of your students can attend at least one hour per week; learning the names of the students; arriving as early as possible to class so that time before class can be used to erase the blackboard, return homework, and answer student questions; having students submit work to be graded frequently so they know how well they understand the material; writing exams and quizzes in a manner that allows you to distinguish between “A” students, “B” students, “C” students, “D” students, and “F” students; giving clear and early indication of what will be expected of students; and *carefully selecting homework problems* (this is probably the most undervalued aspect of teaching undergraduates). These few simple things are often what separates excellent instructors from mediocre ones.

Although I have only begun to express the innumerable components of effective teaching, it should be clear that excellent teaching is not the result of performing a few simple tricks. Instead, excellent teaching occurs only as a result of excellent performance in each aspect of effective instruction.

Teaching Experience:

University of Illinois

- Taught a discussion section of Precalculus in the Fall 1993 semester.
- Taught Calculus II in the Fall 1994 and Spring 1995 semesters.
- Developed and taught “Harvard” Calculus III in the Fall 1995 semester. I was one of a committee of three that developed this small-group collaborative-learning style advanced calculus course. This was the first time that this course was taught anywhere.
- Taught “Numeracy”, a general education math class for students in “non-technical” majors, in the Spring 1996 semester.
- Taught a discussion section of Business Calculus in the Spring 1998 semester.
- Taught a large lecture Business Calculus class in the Spring 1998 semester. This involved teaching over 200 students, and coordinating three discussion section instructors.
- Trained several new teaching assistants in the Math Department Teaching Assistant Orientation from Fall 1995 through Fall 1998.

University of Arizona

- Taught “Harvard” Calculus I in the Fall 1999 semester.
- Taught two sections of “Harvard” Calculus II in the Fall 2000 semester.
- Taught “An Introduction to the Theory of Partitions,” a four week minicourse for first year graduate students in the Fall 2000 semester.
- Headed a Research Tutorial Group in which four first-year graduate students did semester-long research projects in number theory in the Spring 2001 semester.
- Taught “Math in Modern Society”, a general education math class for students in “non-technical” majors, in the Fall 2001 semester.
- Taught undergraduate Abstract Algebra I in the Fall 2001 semester.
- Directed two Masters theses: “Combinatorial proofs of classical congruences for $c_h(n)$, the number of partitions of n in h colors,” for Greg Houser, from Fall 2001 through Spring 2002; and “Sets of integers with l terms in arithmetic progression,” for Eric Roberts, from Spring 2002 through Fall 2002.

Cal State East Bay

- Advising the Cal State East Bay Putnam Team and Math Problems Group since Fall 2004.