TEACHING STATEMENT

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The first time I set eyes on Cy Twombly's painting *Say Goodbye, Catullus, to the Shores of Asia Minor*, I was utterly unmoved. After staring at it for the requisite two minutes, I suggested to my friend that we continue to the next piece. She said, "Wait." As she told me the story of Orpheus, I began to see meaning in the the bright splatters of color, and the scattered verses on the canvas took on a whole new significance, rendering me awestruck. Mathematics is a similar sort of masterpiece, often difficult to appreciate at first glance. Teaching mathematics, I have the opportunity to help my students glimpse the beauty and fascination beyond the scattered formulas on the chalkboard, to tell them, "Wait" before they walk away unmoved, and I consider this a great privilege.

I am an animated and enthusiastic lecturer, and I try to make mathematics more accessible via my approachability both in class and in my office. My classroom is a relaxed and interactive environment where students are encouraged to ask questions, be creative, and, as often as possible, discover mathematics for themselves. For example, I recently used the following strategy to introduce the definition of continuity to my calculus students at OSU.

I began by telling them that, intuitively, a continuous function is a function whose graph can be drawn without lifting the pencil from the paper. Then we decided to try and come up with a more practical definition, one which would be useful for students without graphing calculators. I divided them into small groups and asked each group to sketch a graph of a function which could be drawn without lifting the pencil from the paper at the y-axis. Then I asked them to try and draw graphs of functions illustrating all possible ways that one would have to lift the pencil from the paper at the y-axis. After I collected the findings of each group and summarized them on the chalkboard, we analyzed the pictures in terms of limits, working together until we wrote down the right definition of continuity at $x = 0$, and so forth.

Exercises of this nature demonstrate to students that learning mathematics means learning reasoning skills and analytic and rigorous thinking whose utility extends far beyond their math class. They also help students build confidence; I've found this to be true in particular with my non-science majors, some of whom told me that until my class, they thought they "just weren't able to do math". Moreover, students who work out definitions, counterexamples, etc. for themselves are more likely to remember them.

Exams can be an excellent occasion for students to discover that they enjoy thinking about mathematics and get really excited about solving problems. For example, in my honors course at OSU, I let my students take each exam twice. First they took the exam in class, and then they took home another copy of the exam. I gave them 24 hours to complete the take-home exam, allowing them to use their books and notes. I graded each student's two exams simultaneously, awarding partial credit for problems missed on the in-class version but successfully completed on the take-home version. In my experience, it's typical for one

or two diligent students to ask about a solution to a particular problem immediately after completing an exam. When I used this method of examination, over half of my students stayed in my office after turning in their take-home exams, eager to discuss their solutions to not one, but three or four problems!

After the first time I tried this method of examination, I received overwhelmingly positive responses from several students via the anonymous feedback form on my course website. They commented that it helped them reflect more deeply on the material, understand the material better, and that they learned more from discovering their own mistakes. My own motivation for trying the method was findings of a study presented in Robinson [R] which reveal that there is a greater drop in retention in one day without reinforcement than in 63 days if recall and review are used within the first 24 hours. My findings support Robinson's; many students came to discuss a solution or two with me in office hours in the weeks following the exam, and I was impressed by how easily several of them could recall exam questions without even glancing at their exam papers.

I've worked with a diverse group of students from various socioeconomic and geographic backgrounds, from science majors to art majors, from high school students to adults returning to school after 30 years. Despite their differences, my teaching evaluations reflect that they have uniformly appreciated my enthusiasm and approachability.

As well as being approachable and receptive to questions in class, I make it clear to my students that I genuinely care about their individual progress and am eager to discuss mathematics with them outside of the classroom. For example, I offer them a few extra credit points for stopping by my office during the first week of classes. I repeatedly announce that they may drop by my office outside of my scheduled office hours.

As an undergraduate at St. Olaf College, my confidence and interest in mathematics grew as a result of the encouragement I received from my professors in office hours. As a teacher, I have learned to appreciate office hours for numerous other reasons. For example, determining students' individual difficulties with the material helps me more accurately assess how the class is progressing. I also enjoy getting to know my students as individuals, and getting to know me, they have the chance to see mathematicians and mathematics in a new light. Telling them about conferences all over the world or a party at Jim Simons' house that was like a scene out of *The Great Gatsby* exposes them to a fun aspect of mathematics as a career. After I tell them how I taught myself Italian by studying it the way I study mathematics, they are more likely to believe me when I tell them that mathematical thought is useful for more than solving homework problems.

I am looking forward to my continued growth as an instructor, both in and beyond the classroom. In fall 2005, I supervised two second year OSU graduate students as part of a VIGRE working group. I organized weekly meetings to discuss a paper, and ultimately we gave a group presentation in the VIGRE seminar. I would love to extend this experience to supervising undergraduate research projects.

Teaching mathematics is a privilege. It is one of the most rewarding parts of my career and is extremely important to me. I don't expect all of my students to walk away from my course awestruck by mathematics, but I hope that my enthusiasm and inductive and interactive teaching methods will help them develop a greater appreciation for the subject.

I have taught the following courses. An asterisk indicates a class size of over 100 students. The number in parentheses indicates how many times I taught the course.

- **Precalculus**
  - UNC Math 30: Trigonometry (2)
- **Calculus**
  - OSU Math H161: Honors Calculus I (1)
  - UNC Math 31: Calculus I (2)
  - UNC Math 22: Business Calculus (1)
  - OSU Math 131*: Mathematical Analysis for Business Majors II (2)
  - UNC Math 32: Calculus II (1)
  - UNC Math 33: Multivariable Calculus I (1)
- **Discrete Mathematics**
  - OSU Math 366: Discrete Mathematical Structures I (3)

References

[R] F. P. Robinson, *Effective Reading*. Harper and Row, 1963.