TEACHING STATEMENT

ANAND DEOPURKAR

One of the most enjoyable aspects of being a mathematician is the excitement of sharing the mathematics with others. For me, the most abundant source of this joy is teaching a course. I am passionate about teaching, which is attested by student feedback such as

> "Anand's enthusiasm is infectious even at an unsightly hour of 9 am!"

Students have described me as "exceptional", "phenomenal", and "definitely one of the best professors [they] have had." In addition to great student comments, I have consistently received a median score of over 4.5 out of 5 in end-of-term evaluations and the *Award for Excellence in Teaching*.

Philosophy and technique. One of the fundamental ideas that I try to impress upon my calculus students is that mathematical equations are not merely symbolic rules. They are meaningful statements about the world of numbers and shapes, and by extension, the world around us. In the classroom, this philosophy translates into a clear exposition of the concepts behind the symbols and lots of real-world applications—I remember showing the video of a roller-coaster ride in my vector calculus class to explain curvature and torsion. As a result, students have remarked that

> "[Anand has] an ability to teach complicated material in a way that is easily understandable."

Another important principle in my teaching is the emphasis on connections between topics and the importance of multiple points of view. In my calculus classes, I explain the concepts in many ways: algebraically, geometrically, or by using physics. In more advanced classes, I like to give multiple proofs, discuss analogies, and highlight underlying themes.

I encourage questions and discussion in the classroom. I make my classroom and my office a welcoming place for learning. As a student remarked in their evaluations,

> "[Anand] makes math less intimidating. We aren't afraid to raise our hands and ask questions."

I understand that not every student in the class has the same background. I make sure that I am available outside of class and hold regular office hours. I encourage my students to come and talk to me. Sometimes students who don't have particular mathematical questions show up just to chat!

Experience. As a post-doc and as a graduate student, I have taught many courses at many levels. In terms of material, my classes have ranged from first year *Calculus* to advanced graduate level *Topics in Algebraic Geometry*. In terms of size, they have

ranged from consisting of 8 students to over 100. Here is a summary of the courses I have taught:

- Undergraduate: *Calculus 1, 2, 3*; *Linear Algebra*.
- Advanced Undergraduate: *Modern Algebra 1 and 2*; *Undergraduate Seminar*.
- Graduate: *Moduli of Curves* (Topics course in Algebraic Geometry).

The *Calculus* courses I taught at Harvard and University of Georgia were in small sections of less than 25 students. The ones at Columbia ranged from moderate (about 35 students) to large (about 100). Depending on the size, I used different classroom techniques. In small classes, I often made the students work in groups and present their solutions on the blackboard. In large classes, I complemented my chalkboard lectures with visuals on a projected screen. In both cases, I made sure to encourage active participation.

The *Modern Algebra* sequence was a course in abstract algebra for students majoring in mathematics. It covered groups, rings, fields, and Galois theory. In addition to clear and logical exposition, I discussed motivations for definitions and key ideas. I covered many special topics such as rigid motions, lattices, and arithmetic of number fields.

The *Moduli of Curves* course was attended by advanced graduate students and post-docs. My syllabus had the dual goal of exposing the audience to the rich classical study of curves and also to the powerful modern machinery of deformation theory and algebraic stacks. The course was very well-received.

The *Undergraduate Seminar* was a guided reading course taught in small groups and usually taken by mathematics majors in their third or fourth year. As an instructor of the seminar, my duty was to choose the topic and reference materials, make a plan of the lectures and readings, and guide the students as they read and lecture according to the plan. In addition to leading a section of the seminar, I was also the coordinator for the whole course. I was in charge of choosing the graduate students to lead the other sections and advising them about their topics and plans.

Concluding remarks. In summary, I find teaching an exhilarating part of academic life. It gives me the perfect opportunity to share my understanding and love of mathematics. Finally, and most importantly, by making my classes engaging and by being sensitive to the backgrounds of my students, I strive to make my teaching as rewarding for the students as it is for myself.