Statement of Teaching Philosophy

Alessandra Pantano  
Cornell University

*The whole art of teaching is only the art of awakening the natural curiosity of young minds for the purpose of satisfying it afterward*  - Anatole France (1844 - 1924)

My passion for teaching started in graduate school and only grew stronger during my post-doctoral experience at Cornell. It was a joy to discover that such a strong research department shares one of my basic principles: **being a dedicated teacher does not prevent you from being a productive mathematician, it rather completes you.**

Of course teaching is not an easy task and is tiring at times, but I love it because it is always exciting and extremely rewarding. I look at every class as a continuous challenge: I strive to be clear to the point that no student feels lost, but at the same time I want to stimulate curiosity in the fastest minds.

Through teaching we make a serious impact in the students’ lives: we expose them to the importance and beauty of mathematics, and simultaneously provide them with the mathematical toolbox they will use throughout their careers. At the end of a semester, one of my students wrote: *“In the long run, I feel like I have learned some very useful things that will hopefully help me in my future studies”*. He was a mediocre student, with a great passion for sports and absolutely no interest in calculus at the beginning. By the end of the class, he was proud he had learned something and I was happy I could help.

**Teaching experience and feedback**

Over the past few years I have taught a variety of introductory undergraduate classes, including linear algebra (both in the College of Arts and Sciences and in the School of Engineering), multi-variable calculus and honors calculus. The feedback from the students has always been enthusiastic (one wrote: *“Fantabulous. We need more Pantanos”*) and I was recognized with the Princeton Engineering Council Excellence in Teaching Award and the Cornell Mathematics Department Junior Faculty Teaching Award¹.

While at Cornell, I also had the privilege to fully design a topic graduate class in representation theory. My lecture notes were a critical synthesis of several classic texts in the field, resulting in a complete introduction to the representation theory of finite groups (with a special focus on the symmetric group)². Although this was my first graduate class, I received positive reviews from the students (clarity and good organization were ranked 5/5), and this experience helped shape my future teaching interests at the graduate level.

---

¹ Nomination letters are available through the Math Department at Cornell and the Engineering Council at Princeton, upon request.
² Class notes and syllabus are available on my web-page ([www.math.cornell.edu/~pantano](http://www.math.cornell.edu/~pantano)).
Future teaching interests

I would like to continue playing a big role in graduate and undergraduate education. A good grasp of the mathematical fundamentals is essential to students in all the scientific/technological disciplines; and often, as I know from first-hand experience, it is the first few math classes that convince students to major in math and possibly pursue graduate studies. One of my (Multivariable Calculus) students wrote “Professor Pantano was wonderful. She stimulated our interest and made everything clear. My interest in math has blossomed after her teaching”.

In addition to teaching the first- and second-year courses in mathematics, I would like to be involved in shaping the graduate/upper-level undergraduate curriculum in algebra. In particular, I am looking for a chance to introduce the students to the wonderful area of representation theory, by establishing an enthusiastic mentoring initiative, ranging from entry-level seminars (like the MIT “Baby Rep”) to introductory classes. Besides the course on the symmetric group that I designed at Cornell, I would like to teach an upper level undergraduate class on the theory of finite groups and their representations, and an introductory graduate class on Lie groups and Lie algebras. Representation theory is a wonderful area, sometimes sadly underrepresented, and I want to contribute to spread its appeal.

Teaching style

My teaching style solidly rests on three pillars: clarity, enthusiasm and caring.

Clarity - When teaching both graduate and undergraduate classes, I always strive for clarity, which I believe is fundamental to the effectiveness of the lecture. Making every concept and technique sound straightforward while at the same time motivating the students to think critically is perhaps the biggest challenge that I face everyday in class. Preparing lecture notes before class helps me deliver clear and well-organized lectures. Students said they found my lectures “clear, very interesting and well organized”.

Enthusiasm - To me, preparation goes hand in hand with passion. After all, my job as an instructor goes beyond knowledge transfer. I want the students to learn math, but also to enjoy it, and this requires more than preparation on my side: I must be enthusiastic. During lectures, I always have a positive attitude: I encourage the students to ask questions and I answer them with a smile. This approach pays off: the atmosphere in class is friendly, and when I ask students to come to the blackboard and solve some problems, I never have trouble finding a volunteer. In the teaching evaluations, students have called my lectures “fun and interesting”, and have thanked me for the “wonderful time” they had in class. Transmitting the passion for math is one of my tasks.

Caring - Caring about the students and their learning is a key ingredient of my teaching style. During class, I constantly look at the students, and try my best to adapt the lecture according to the expression on their faces. In order to balance the pace of my teaching with the pace of their learning, I often pause and take a few minutes to summarize the latest concepts. The students emerge reassured, and eager to learn more math. Extra office hours, supplementary hand-outs and careful responses to their e-mails complement my class involvement. Throughout the semester I work in parallel with the teaching assistants and the college administration, in a common effort to identify the
students with particular difficulties: when the weaker students become aware of our sincere interest in their learning, they immediately feel more motivated and perform better. Out of all the comments I have received from the students over four years of teaching, the two that pleased me the most are: “You were clear and easy to follow, but most of all, you seemed like you really cared about our learning”, and “Professor Pantano is an amazing teacher in lecture, after class, during office hours and all around. She is extremely amiable and dedicated to help us learn.”

**Challenges**

Teaching at this level of involvement obviously takes a significant amount of time. One of the biggest challenges for an academic career is balancing research and teaching. This has certainly been a learning curve for me, but during the years my time management skills have evolved to a level of multi-tasking I am now comfortable with. In my mathematical career, I will strive to be both a very good researcher and a very good instructor. This is a major challenge, one that I am very ready for.