Statement of Teaching Philosophy

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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).
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.
Recognition for Teaching Accomplishments

- **Cornell University, 2006-2007 Department of Mathematics Junior Faculty Teaching Award**

  The Department of Mathematics has established a Junior Faculty Teaching Award in recognition of the importance of the place of junior faculty in the teaching and learning of mathematics. The award will be announced in early December. Awards will be made based upon the faculty member’s ability to develop student’s appreciation and understanding of mathematics. *Eligibility:* Tenure-track assistant professors, H. C. Wang assistant professors, and visiting assistant professors.

  - [http://www.math.cornell.edu/News/news.html](http://www.math.cornell.edu/News/news.html)
  - [http://www.math.cornell.edu/Courses/tawards.html](http://www.math.cornell.edu/Courses/tawards.html)

- **Princeton University, Engineering Council Spring 2002 Teaching Award**

  The "Excellence in Teaching" Awards were initiated by engineering undergraduate students in the fall of 1988 in an effort to enhance the quality of education at Princeton. Any professor or teaching assistant for an undergraduate engineering, mathematics, physics, or related course is eligible to receive an award. The Engineering Council looks for dedication, talent, and a commitment to student learning that surpasses the norm.

  - [http://www.princeton.edu/~ecouncil/teachingawards.htm](http://www.princeton.edu/~ecouncil/teachingawards.htm)
# Most Recent Teaching Evaluations at Cornell University (Fall 2006)

**Multivariable Calculus (MATH 192), 3 lectures**

<table>
<thead>
<tr>
<th>Did the lecturer stimulate your interest in the subject?</th>
<th>Lecture 7</th>
<th>Lecture 11</th>
<th>Lecture 13</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - not at all 5 - stimulated great interest</td>
<td>4.07</td>
<td>4.44</td>
<td>4.60</td>
</tr>
<tr>
<td></td>
<td>historical average* 3.25</td>
<td>historical average* 3.25</td>
<td>historical average* 3.25</td>
</tr>
<tr>
<td>Was the lecture presentation organized and clear?</td>
<td>4.88</td>
<td>4.69</td>
<td>5.00</td>
</tr>
<tr>
<td>1 - disorganized &amp; unclear 5 - very organized &amp; lucid</td>
<td>historical average* 3.82</td>
<td>historical average* 3.82</td>
<td>historical average* 3.82</td>
</tr>
<tr>
<td>Was the lecturer willing and available to help you?</td>
<td>4.69</td>
<td>4.80</td>
<td>4.60</td>
</tr>
<tr>
<td>1 - was of no help 5 - was very helpful</td>
<td>historical average* 3.80</td>
<td>historical average* 3.80</td>
<td>historical average* 3.80</td>
</tr>
<tr>
<td>Rate the overall teaching effectiveness of the lecturer</td>
<td>4.50</td>
<td>4.69</td>
<td>4.90</td>
</tr>
<tr>
<td>1 - worse than average 5 - much better than average</td>
<td>historical average* 3.61</td>
<td>historical average* 3.61</td>
<td>historical average* 3.61</td>
</tr>
</tbody>
</table>

*historical lecturer averages at Cornell University (1996-2004)*

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**Selected comments from students**

Professor Pantano was wonderful. She stimulated our interest and made everything clear. My interest in math has blossomed after her teaching. *Multivariable Calculus, fall 2006, lecture 11*

I enjoyed the lectures very much. The professor presented the material very clearly, In addition, she is a very amicable person and I felt comfortable in the lecture. In fact, I think this was my highest attended class this semester. *Multivariable Calculus, fall 2006, lecture 13*

Lectures were great. A few of my friends stopped going to their lectures and came to this one because they heard she was a good lecturer. Her diagrams and pictures were very good, and I think that made the course a lot better and easier to understand because of the visuals. *Multivariable Calculus, fall 2006, lecture 11*

Lectures were very interesting and well organized. *Multivariable Calculus, fall 2006, lecture 7*

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. *Multivariable Calculus, fall 2006, lecture 11*
Other Teaching Evaluations at Cornell University (Fall 04-Spring 06)

<table>
<thead>
<tr>
<th></th>
<th>Multivariable Calculus</th>
<th>Honors Calculus</th>
<th>Linear Algebra</th>
<th>Topics in Algebra</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MATH 192</td>
<td>MATH 122</td>
<td>MATH 221</td>
<td>MATH 739</td>
</tr>
<tr>
<td></td>
<td>fall 2004</td>
<td>spring 2005</td>
<td>fall 2005</td>
<td>spring 2006</td>
</tr>
<tr>
<td></td>
<td>Lecture 12</td>
<td>Lecture 13</td>
<td>Lecture 5</td>
<td>Lecture 1</td>
</tr>
<tr>
<td>Did the lecturer stimulate your interest in the subject?</td>
<td>3.48</td>
<td>4.13</td>
<td>3.67</td>
<td>4</td>
</tr>
<tr>
<td>1-not at all</td>
<td>historical average*</td>
<td>historical average*</td>
<td>historical average*</td>
<td>historical average*</td>
</tr>
<tr>
<td>5-stimulated great interest</td>
<td>3.93</td>
<td>3.28</td>
<td>4.64</td>
<td>N/A</td>
</tr>
<tr>
<td>Was the lecture presentation organized and clear?</td>
<td>3.88</td>
<td>4.71</td>
<td>4.45</td>
<td>5</td>
</tr>
<tr>
<td>1-disorganized &amp; unclear</td>
<td>historical average*</td>
<td>historical average*</td>
<td>historical average*</td>
<td>historical average</td>
</tr>
<tr>
<td>5-very organized &amp; lucid</td>
<td>4.63</td>
<td>3.56</td>
<td>4.55</td>
<td>N/A</td>
</tr>
<tr>
<td>Was the lecturer willing and available to help you?</td>
<td>4.17</td>
<td>4.88</td>
<td>4.55</td>
<td>5</td>
</tr>
<tr>
<td>1-was of no help</td>
<td>historical average*</td>
<td>historical average*</td>
<td>historical average*</td>
<td>historical average</td>
</tr>
<tr>
<td>5-was very helpful</td>
<td>4.54</td>
<td>3.92</td>
<td>4.06</td>
<td>N/A</td>
</tr>
<tr>
<td>Rate the overall teaching effectiveness of the lecturer</td>
<td>3.74</td>
<td>4.25</td>
<td>4.08</td>
<td>4.5</td>
</tr>
<tr>
<td>1-worse than average</td>
<td>historical average*</td>
<td>historical average*</td>
<td>historical average*</td>
<td>historical average</td>
</tr>
<tr>
<td>5-much better than average</td>
<td>4.3</td>
<td>3.38</td>
<td>3.52</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* historical lecturer averages at Cornell University (1996-2004)

Selected comments from students

Professor Pantano was one of the best math professors I have ever had. When she had to be replaced by other professors for a couple of lectures, I was able to see just how much better she was by comparison. Also, she went out of her way to provide extra office hours when needed and explain the material very clearly. *Linear Algebra, Cornell University, fall 2005*

Alessandra is an absolutely amazing teacher. I have truly never had an instructor better than her. Form any facet, personality, teaching ability, help outside of class, she goes far beyond excellence. I have submitted her name for any teaching award out there and if she doesn’t receive recognition for her outstanding ability it will truly be a shame. *Linear Algebra, Cornell University, fall 2005*

Alessandra is the best instructor I have had in three years in Cornell. I hadn’t had a math class in that length of time, that I really enjoyed the class despite my rustiness. Her lectures were clear and well-planned, she hosted many office hours, especially as exams approached, and she made extra practice problems to help the class understand any concept we struggled with. *Linear Algebra, Cornell University, fall 2005*

Thanks for a great semester. I had a lot of fun and learned a ton. Thanks for being so patient, helpful, and accommodating all the time. *Honors Calculus II, Cornell University, spring 2005*

I had a wonderful time in your calc class and I hope to have you as a teacher in the future! *Honors Calculus II, Cornell University, spring 2005*
Narrative Teaching Evaluations at Princeton University (Spring 2002)

Linear Algebra (MATH 202)

Please comment on the strength of the course

- The preceptor is the best!
- N/A
- Class instructor was amazing in responsiveness/explanation of material
- Alessandra was an amazing teacher
- Great class instructor, good pace, useful/practical concepts
- Alessandra made the course fun and interesting
- Well organized, my preceptor was incredible. Pantano worked tremendously hard, well over the minimum, to help us out
- Excellent teacher. Alessandra Pantano made herself open to all students. Review sessions were great
- Alessandra was an excellent instructor. Review sessions, notes, classes were helpful, and Alessandra did well in clarifying the difficult material
- Alessandra is the best math teacher: really clarifying, really goes out of her way to help. Interesting material
- Alessandra!! she is amazing, so helpful, available and really good at explaining everything
- My preceptor was great… she is the best thing that happened to the course in my opinion
- N/A
- Alessandra is the best instructor I have had here (including professors). She was available anytime and made difficult material fairly easy to understand

Please comment on the specific component of the course: “Precept/Classes/Seminars”

- The preceptor is clear and patient
- The preceptor did a fabulous job explaining the material and answering questions
- Extremely informative
- Helpful
- Great instructor made material very easy to learn
- Alessandra Pantano is an unbelievable teacher
- Pantano held review sessions and unlimited office hours to help us out. She was so good that attendance was very high for a 9am class
- Excellent. Clear and interesting
- Good, good notes, clear, easy to ask questions
- Fantabulous. We need more Pantanos
- Alessandra is great
- Excellent. Preceptor did an excellent job explaining/clarifying/answering questions
- The best math teacher I have ever had, always thought of us (her students) and what would be best for us
- Excellent