

Teaching Statement

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March 31, 2022

Teaching is a crucial part of academic activity, and I enjoy interacting with students and sharing my enthusiasm for mathematics with them.

As a student, I valued teachers who introduced concepts thoroughly, sparked interest for the field, encouraged students to work on further research projects, and cared for the students in an individual, helpful, and friendly manner. In my experience as a teacher, I have understood that mathematics is probably best learned through challenge, and pedagogical scaffolding makes it possible: I am always on the lookout to not give all the answers, and to never ask awfully difficult questions. This maintains the connection with the students and renders the learning active and fun. This is what I strive to achieve.

The experience of both learning and teaching at Paris Sciences et Lettres, Princeton University, and CIMAT, Mexico, gave me a chance to contrast two different styles of education. From these I derived an effective hybrid.

At Princeton, even service courses were always directed to stronger, highly motivated students. The semester is short, and the material needs to be covered quickly, completely, and concisely. The challenge was to deliver a very high-quality lecture that meets their standards.

From this, I have learned to take a no-nonsense approach. I take my time before class to synthesize and digest the information, find very meaningful examples, plan some jokes, and prepare for a fast-paced, very graphical class that will be at the same time relaxed and appealing to the students.

At CIMAT, the challenge was to engage the students and to help them focus on the material. I learned to motivate each topic very well, to give

many points of view, to be creative and innovative when choosing teaching methods, and also to deal with students in difficulty.

In Paris, I faced a significant cultural difference — it turns out that the French system is much more different to the American and the Mexican ones than those are to each other. Probably the main reason is that the French system is more open to innovation and experimentation, and has thus evolved faster, in ways I thought were very positive, like the elimination of the less useful trigonometric functions, namely, cotangent, secant, and cosecant. But I was not expecting it, and at the beginning this kept my students from understanding some of what I was saying when, for example, the result of an integral was the secant squared. I think the best lesson I got from that experience was just how crucial it is to verify the common background.

Both at Princeton and at CIMAT I held computer lab sessions, during which I further motivate the concepts through meaningful computer simulations, challenging the students in ways that would be impossible in the traditional homework. When I do this, I also leveraged the visualization capabilities of today's software to give intuitive perspectives on the more advanced courses that motivate the material of the basic ones. This works great at getting students interested in majoring in math-rich areas. I have also been involved in teaching two short courses for teachers on how to design these sessions.

Finally, I try to be very approachable and students constantly go to my office hours. With some students, it is more efficient to talk one-on-one because many more lines of communication open up and inhibitions are reduced, so they learn faster. I also try to be creative about office hours; at some point I was holding some of them during Sunday brunch in one of the university dining halls, and students loved it.

TEACHING EXPERIENCE

At the Toulouse School of Economics:

Spring 2021 Travaux dirigés, Statistiques Inferentielles
Travaux pratiques, Optimization for Big Data

At PSL/ESPCI, Paris:

2016–2017 Travaux dirigés, Mathématiques Fondamentales 2

At Princeton University:

Spring 2013 Lecturer, Linear Algebra with Applications

Fall 2012 Lecturer, Multivariable Calculus, 2 sections

Spring 2012 Teaching Assistant and Grader, Multivariable analysis

Fall 2011 Teaching Assistant and Head of Graders,
Mathematics for Economists

Spring 2011 Grader, Multivariable Calculus

Fall 2010 Lecturer and Grader, Calculus II

Fall 2009 Grader, Multivariable Calculus

At CIMAT, Guanajuato, Mexico:

Spring 2007 Teaching Assistant, Calculus I

Fall 2005 Teaching Assistant, Visualization Workshop:
a Mathematica-aided multivariable calculus course

At Universidad Iberoamericana, Mexico City:

Summer 2003 Lecturer, Mathematica in the Classroom