

Teaching Statement (Peyam Tabrizian)

There are two things that I pay special attention to when teaching. The first one is enthusiasm. I am blessed to be passionate about mathematics, and my goal is to convey that passion to my students. This is why I try to present my lectures with as much excitement as possible. In addition to jokes and songs, I use fun analogies in lectures to absorb the concepts taught, like Bomberman to calculate determinants or Super Mario to explain induction. Students repeatedly commented that my “pedagogy and enthusiasm is truly one of a kind,” and that I’m “so enthusiastic that it’s infectious.”

The second aspect is organization. In my opinion, a perfect lecture should flow as smoothly as a piece of classical music, while, at the same time, offer room and flexibility for students’ questions and confusions. This is why I spend a considerable amount of time preparing my lectures, including the fully worked-out problems. My lesson plans always have a clear outline, which I announce at the beginning of class, so that the students have a better view of what I am going to cover. My favorite comment reflects precisely this attitude towards teaching: “If Erdős was right in saying that there exists some book of beautiful proofs and perfect solutions for every theorem, Peyam has probably found the book on how to teach Linear Algebra perfectly.” As an added benefit, because my notes are so detailed, I can post them on my website prior to each lecture, in order for my students to use them in their studies.

In the words of Steve Krantz in *How to Teach Mathematics*, I consider myself an intermediate between a sage-on-the-stage and a guide-by-the-side. This means that, while not completely giving up the traditional lecture format, I use an example-based approach when teaching. Whenever I introduce a new concept, I start with a concrete problem first. For example, when solving second-order differential equations, I first focus on a specific example, like $y'' - 5y' + 6y = 0$, and use that example to guide the students throughout the discussion of the theory. Many students commented that “[I] take time to work out examples completely and always show [them] cool advanced examples.” This format promotes active learning, because it allows me to ask the students questions like “Can someone explain to me what the next step is?” In fact, I have recently implemented a new think-pair-share-like strategy, where I would write an example on the board, give the students a couple of minutes to discuss possible solutions, and then show them how to solve it. So far, this strategy has proven to be extremely effective in making sure they absorb the concepts and pay attention, especially in a 100 people lecture.

One teaching achievement I am particularly proud of is the result of a risk I have taken during Summer 2012 at UC Berkeley, when I taught “Linear Algebra and Differential Equations.” This course usually consists of 5 weeks of Linear Algebra, followed by 3 weeks of Differential Equations. The problem with this classical approach is that students usually forget the linear algebra-part by the time they are in the middle of the differential equations-part. More importantly, it doesn’t highlight the beautiful connection between those two fields. When I taught the class, I instead mixed up the topics, covering a Linear Algebra topic (e.g.

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orthogonality) followed by the corresponding Differential Equations one (Fourier series). The students really appreciated this because it “helped them master the material and also revealed the underlying beauty and connectedness of mathematics [...] and led to the type of genuine understanding of the material that becomes permanent in the memory”. As a result of this achievement, the UC Berkeley Graduate Student Instructor Teaching and Achievement Center awarded me with the Teaching Effectiveness Award in 2013.

I am always trying to find technological tools that help the students understand the subject, like showing demos in my PDE class that predict the outcome of the transport equation, writing my lecture notes with OneNote, and even using my YouTube channel “Dr Peyam,” created in 2017 and which currently has more than 31,000 subscribers and 450 videos. On this platform, I upload a variety of videos, including videos on topics covered in lecture, review-videos, extra practice problems, and other ones that are accessible to a more general audience. Students generally find that “the videos were of such huge help” in their studies.

Related to this, since Fall 2019 I have been piloting what I like to call *Virtual Office Hours*. Every week at a predetermined time, I send my students a YouTube livestream link, which virtually teleports them to my office, where they can comment with questions or concerns. This is especially useful for students cannot make it to my regular office hours due to personal reasons. Moreover, students who miss them can always look at the transcript of the office hours to see if their questions have been answered. This idea has been a tremendous success: not only has office hour attendance has increased, but several students even asked me if I could replace my regular office hours with virtual ones since they are so convenient.

I strongly believe that teaching should extend beyond the classroom, which is why I am involved in several extracurricular teaching activities, such as being a coordinator for the Level 1 UCI Math Circle, leading a PDE reading course for advanced undergraduates in Spring 2019 and (expected) 2020, and creating the *Teaching Lunches*. The latter is an informal teaching seminar where graduate students and faculty would get together and discuss their teaching experiences and strategies, with the hope of building a stronger teaching community. It currently has 6 people in it and we discuss topics such as “How to increase student participation,” and “How to write a good exam.”

In return, the students really appreciate my teaching, which are reflected in excellent teaching evaluations. In addition, I have, in addition, received several teaching awards, such as the *Outstanding Graduate Student Instructor (GSI) Award* in 2012, the (above mentioned) *Teaching Effectiveness Award* in 2013, the *Nikki Kose Memorial Teaching Prize* in 2016, and the *Outstanding Contributions to Undergraduate Education Award* at UC Irvine in 2019, awarded by the School of Physical Sciences at UCI. The latter is even more impressive given that, at that time, I was just a second year Visiting Assistant Professor.