

TEACHING STATEMENT

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 present my lectures with as much excitement as possible. In addition to jokes and songs, I use fun analogies and mnemonics in lectures to absorb the concepts taught, like Bomberman to calculate determinants, Super Mario to explain induction, and Quixotic Peyam for conservative vector fields. Students repeatedly commented that my energy is “immaculate” and “unmatched by any professor [at] Brown” 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. This is why I spend a considerable effort 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. 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.”

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 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” and that I am “incredible at breaking down complex problems into easy to understand and manageable chunks”

Over the last couple of years, I have been working on typing out detailed lecture notes using LaTeX, which outline everything that I’m planning on covering during lecture. That way the students can not only read ahead for lecture but also follow along during lecture. This helps present my lectures in a more inclusive and accessible way. Students commented that my “notes are really clean and super intuitive, where all the work is shown” and that they “allowed [them] to pay attention in class without fear of forgetting to jot some notes down.” I currently have complete set of notes for Multivariable Calculus, Linear Algebra, Ordinary and Partial Differential Equations, Statistics, Analysis, and Operations Research.

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 elegant connection between those two fields. When I taught the class, I instead mixed up the topics, covering a Linear Algebra topic such as orthogonality, followed by the corresponding Differential Equations one, such as 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, the UC Berkeley 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 lecture notes with LaTeX, using Python to solve differential equations, and even using my YouTube channel "Dr Peyam" created in 2017 and that currently has more than 161,000 subscribers and close to 1000 videos. On this platform, I upload a variety of videos, such as ones 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.

In light of the COVID-19 situation, it was important to quickly adapt my teaching to the online format. Fortunately, my YouTube channel has been of tremendous help. In Spring 2020, I taught an Introduction to Analysis course entirely online. Lectures consisted of recording 3-5 YouTube videos each, as well as writing up detailed lecture notes. Office Hours were held both via Zoom and via YouTube, using the livestream option. Students have commented that, despite being in a virtual format, my "lecture [was] still very clear and just like we are learning in the classroom" and that "the quality of [my] videos are great since [I] have experience uploading videos." Even in the online Differential Equations course I taught in Summer 2023 at Brown, students said that "Professor Tabrizian does an amazing job at engaging students even in an online setting."

In return, the students really appreciate my teaching, which is reflected in excellent teaching evaluations. In addition, I have 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.