

# Teaching Statement

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## Teaching Experience

I have served as a teaching assistant since my first year as a Ph.D. student. I also served as an instructor for the first time in the summer of 2021. It is a joy to teach and to see my students succeed and I am constantly striving to become a better educator. Many students have commented on me being patient and caring about the students ([7], [8], [9]).

## Teaching Philosophy

Mathematics is usually considered to be hard to learn. Anxiety or confusion can easily emerge when the students fail to understand a new notion. Therefore, I think it is very important to explain very clearly to the students “*why certain mathematical theorems are what they are*” [2]. One method I used is that I always try to do some concrete examples before formally proving an abstract theorem. For example, before showing the students that the inner product of two vectors is the product of their norms and the cosine of the angle between them, I would first show that it is true when one of the vectors is a standard basis vector (which is much easier). After that, the students might naturally conjecture that this is true in general, and hence be more impressed when I show that the conjecture is indeed correct. Another method I used to avoid confusion is that I always encourage my students to ask questions. I will stop from time to time to check that if the students are confused. Sometimes I ask some easy questions to make sure that the students are following and encourage them to participate in the class.

One common practice of my teaching is that I always try to help the students to find the answer by themselves, rather than simply giving out the answer. This is because I believe that the students will remember and understand the solution better if they find it independently (or partially independently). To achieve this goal, I will try to replace a difficult question with an easier but related one. This is motivated by one of my favorite quotes about solving problems by George Pólya: “*If you can’t solve a problem, then there is an easier question that you can solve: find it!*” I personally find it very useful and I always try to apply it when a student approaches me with a question that they cannot solve. Many students commented that this style of teaching is helpful ([4], [5], [6]).

Below are some specific comments I have received from past teaching evaluations. Full evaluations can be found on my website.

## Quoted student comments

- [1] He is a professor who is very responsible to students, and he is very serious about teaching. His lecture pace has taken care of every student. I think he is a very modest and excellent mathematics professor. I am in love with math!
- [2] Professor Nie was and is very intelligent and knowledgeable in this course's material. He knows why every aspect of a concept or formula is the way it is. He can explain to you why certain mathematical theorems are what they are.
- [3] Professor, almost always would provide "proofs" for newly introduced mathematical concepts during his lectures. These "proofs" would outline and show the process of why a formula is the way it is.
- [4] I really appreciate how available Jiaxi was during the quarter. I could always pop in his office hours when I needed help. He was also very helpful for the homework problems during discussion – he cleared up PLENTY of confusion every time. Sometimes, if we got something wrong or said something wrong he could be a little aggressive in correcting us, which is understandable because wording matters when explaining and proving things in math. However, it could be approached more lightly. I thank Jiaxi for helping us with the homeworks and concepts as he thoroughly went through examples, but always encouraged us to find the answer on our own.
- [5] Very good TA. Hints on HW really promoted learning without just giving out answers.
- [6] Jason goes out of his way to help students without giving them any explicit answers, and I really appreciate it. That being said, his hints can sometimes be a bit abstract and confusing, but I know he just wants me to come to the correct conclusion on my own. I would just request that he sometimes be a little bit more concrete in his hints, as this class is very difficult. Overall, he was a huge help and my grade would not be as high as it is without him!
- [7] He was patient with us when we clearly did not understand the material at all. Helped us understand the homework instead of just giving answers.
- [8] Good TA carefully helping us on HWs. reliable and patient.
- [9] Clear explanations during discussions, really helpful and cares about the students. I appreciate how he always tries to answer questions that students have. Favorite Quote: "The answer is not important".