Teaching Statement
Tuoc Van Phan

Teaching is an art of conveying knowledge to students who are on different levels of background and understanding. I began to learn this art when I was in high school by helping family members and friends understand mathematics. Since then, I continued to assist friends and classmates with the study of mathematics and preparing for exams. My first real teaching job started when I was a graduate student at the University of Minnesota, where I led weekly recitation sections. Ever since then, I have successfully taught many courses both in undergraduate and graduate levels, and my passion for teaching has been continuously growing.

Overall, my teaching style is made up of different techniques adapted and revised yearly based on the need of each class. Factors that influence my teaching style are class level, size, and type of the audience. My teaching style varies from class to class with the aim at generating a comfortable study atmosphere, while making mathematics understandable and enjoyable for all students.

One of the important features of my teaching is being extremely well-prepared. Before each semester starts, I carefully select the text books and topics to be covered, and prepare lectures and homework assignments in advance. Over the years, I find that creating a syllabus and handing it out to students on the first day of class to be an efficient and effective means of establishing a solid foundation for the class. Every syllabus provides the goals, topics, grading policy, expectations, office hours and contact information for the course. This provides students with a guideline of what is expected during each lecture and creates a more organized class throughout the semester.

In preparation for the lectures, I search for the simplest way to present the underlying concepts and ideas to students. I find that my strong mathematics research background greatly helps me with this. Each concept, intuition and theory can be prepared and explained in a very neat, stimulating way from my experienced understanding of the topics. I am also very careful in selecting questions for the homework assignments to reflect and cover all of the topics discussed in class. One key factor that enables me to establish a line of communication between my students is to frequently pause and ask questions. This makes students think and engage in the class and also help them follow and understand the discussed topics much better. In beginning undergraduate classes, group work is an effective means to engage students in problem solving, while also allowing me the time to assist each group with their individual problems. This also helps me know what areas of lecture need more focus. Homework problems are then adjusted to cover a wide range of topics and difficulty. Each week homework is promptly returned to students with comments, suggestions, and corrections. Solutions of these assignments are also posted online weekly and some selected problems are also discussed or solved at the beginning of class.

In relation to class preparation, I find that intellectually stimulating lectures are essential to making mathematics attractive and relatable to students. For beginning undergraduate level classes, I spend several minutes in the first day showing some slides about the history of the topics and then explaining where and how they apply.
in real life. When covering a new topic, I visualize it or give some examples of concrete applications. For instance, I use animated pictures to visualize the concepts of tangent planes, critical points, and shadow points in my multi-variable calculus class. While teaching about level curves, I also show students an animated movie which has a plane moving and cutting a graph of a function from which students can see many level curves clearly. I then show some applications of level curves in forecasting weather and hiking. For upper level classes, I emphasize intuition, the geometric ideas underlying in the complicated proofs, and the connections or applications of those ideas to related concepts. I find this to be effective at achieving a higher degree of understanding of the topics among students of all levels.

Creating a friendly, interactive environment is another crucial aspect of my effective teaching. At the beginning of each semester, I always spend the effort to learn a little about my students, such as their majors and backgrounds. Not only do I become familiar with my class, but I can also adjust my teaching accordingly. I also encourage students come to my office if they need any help or want to pursue a topic further. Occasionally injecting a joke or a story is perhaps one of my favorite ways of refreshing the learning atmosphere, as well as to help students feel comfortable in my class so that they can study more effectively and remember the concepts and techniques.

In conclusion, teaching is one of the most enjoyable and essential aspects of my mathematical career. My successful mathematics teaching is due to my ability to combine a variety of approaches at presenting the material to students at different levels of understanding. Over the years, I find three qualities that create an effective teacher. They can be listed as: first, good preparation with clear understanding of the topics and excellent communication skills; second, generating and delivering intellectually stimulating lectures allowing students to expand their knowledge base; third, creating a comfortable, friendly, interactive learning atmosphere by continuously encouraging questions, independence, and creative thinking. I find that in my classes, students can not only work hard, but can also enjoy mathematics. It is always a great joy for me to see students gain valuable mathematics background and become fans of mathematics. Most importantly, I feel rewarded at the end of each semester when I receive positive evaluations from students.

Last but not least, I very appreciate the value of the research by undergraduate students and would love to be a mentor for such research projects. Directing research projects for graduate students would also be very important to me.

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