Statement of Teaching Philosophy

My current teaching philosophy has four components: motivating students through examples, teaching for intuitive understanding, empowering students to solve real-world problems and building a supportive and vibrant learning environment.

**Use examples**

My teaching and research experience taught me that many students want to be shown why a concept or theory is useful before they want to study it further. One technique that I use is teaching from concrete examples. When first seeing a concept, it is important for students to be grounded in a simple and understandable example. For instance, a lecture on Markov chain could start with a weather model where the modeler makes weather forecasts using probabilities of weather conditions, given the weather on the preceding day. This simple model serves as an introduction to the statement space and the time parameter space of a Markov chain. It also serves as an excellent example to demonstrate step by step how a transition-probability matrix is constructed and how predictions can be made through matrix multiplication.

**Foster intuitive understanding**

My experience has informed me that intuition plays a very important role in research. Sometimes, one can translate directly one’s intuition into a rigorous proof. I thus see it as a necessary part of my pedagogical responsibilities to help students achieve an intuitive understanding of mathematical concepts. One approach that I utilize is to draw graphs and diagrams. For instance, I find Venn diagrams tremendously helpful in teaching probability theory. They allow abstract ideas to be more visible. Venn diagrams enable students to organize information visually so they are able to see the relationships between two or more sets of items. As another example, I find it very helpful to draw a state-transition diagram in order for students to develop a mental image of the Markov chain. Indeed, until students are very familiar with Markov chains, I would prefer transition diagrams over transition matrices.

**Empower students through in-class practice**

My interactions with students from the stochastic modeling class helped me realize that students tend to have difficulties in translating new real-world random phenomena to an appro-
appropriate stochastic model. My experience has led me to believe that the skills of solving new problems can only be gained by a considerable amount of practice. For instance, after showing how a queueing model can be analyzed through a Markov chain, I encourage students to try to solve a different and yet similar problem (such as an inventory problem) in class, so as to see if they really understand the key concepts and solution approaches. It is significant that students are able to receive immediate informative feedback for in-class practice problems.

**Create a positive learning environment**

To inspire and motivate my students, I plan to use interesting examples to illustrate the broader relevance and implications of lecture concepts. To create a vibrant learning environment, I plan to break up lectures by introducing Q&A or short partner-work session to encourage subject-related discussions. In addition to addressing questions in class, I hold office hours allowing for in-depth discussion about the course materials and homework questions.

During my time at Columbia, I find email to be an effective way of communication. As an instructor, I will try to respond to students’ emails in a timely fashion so that they know that I am still reachable outside classrooms. For each class that I am responsible for, I will maintain, to my best, an informative course website so that most students can resolve their questions through a visit to the website.

**Teaching interests**

I am happy to teach a wide variety of probability courses for undergraduates and graduate students. Within my field of expertise, I am particularly qualified to teach courses in introductory probability, stochastic models, simulation and queueing theory. I would also enjoy teaching pricing models for financial engineering, continuous-time models and service operations.