Statement of Teaching for Nandita Dukkipati

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I was fortunate to have had several outstanding teachers - their classes so engaging that I recall being excited after each lecture, eager to learn more, and looking forward to the next lecture. Learning was a pleasure. With passing years I forgot the textbooks but not the lectures. This is the kind of experience I want my students to have. My teaching objectives are rooted in my excitement for Networking research. Apart from getting across the subject material effectively, my goal is also to share my enthusiasm for the field of Networking and its related disciplines. Through my experience as a Teaching Assistant at Stanford as well as a student, I have identified the following as key to achieving my goals:

1) *Design intriguing lectures and motivate the content by choosing apt examples drawn from real systems:* An engaging Networking class is more than a collection of isolated facts. Rather, it is a coherently intertwined story weaved together from fundamental concepts and appropriate examples drawn from real/prototype systems of both Industry and Academia. Not only does it make attending classes a unique and worthwhile experience but perhaps more importantly, it helps students realize why learning the subject at hand is a good investment of their time. As a Teaching Assistant for Packet Switch Architectures, I applied this principle when teaching review sessions. For example, when teaching Probability, I took the time to prepare material on the applications of probability in Networking, how it not only enhances our understanding of existing systems but can also guide us when designing new ones. It appealed to the students.
   Design problems in Networking and Systems rarely have obvious right and wrong answers, with economics, technology, and non-obvious engineering constraints often influencing the choices made. A crucial part of my teaching will be to foster critical thinking of and draw lessons from historical and existing networking systems.
2) *Explicitly bring out the interdisciplinary flavor of Networking:* Networking is a blend of several disciplines. In my teaching, I will make a deliberate effort to explicitly bring out the interdisciplinary flavor - on how theoretical results in Probability, Control Systems, Graph Theory, Algorithms, and Optimization techniques are used to analyze existing systems and lay the foundations for new designs, how concepts in Operating Systems, Distributed Systems, and Hardware Design help us build practical systems, and how principles in Economics align the incentives for a multiplayer system. Fortunately, I have had good exposure to several of these disciplines as a student and I immensely enjoy the process of synthesizing concepts from disparate disciplines and applying/teaching them in the context of networks.
   I also believe that hands-on assignments/projects are of paramount importance in learning networking concepts. Using tools such as Virtual Machines (eg. User Mode Linux, VMWare), Stanford's Virtual Network System (VNS) and simulators such as *ns2*, I will create educative experimental projects for the students.
3) *Preparation is the key:* I believe to be an outstanding teacher comes through with a lot of preparation as well as trial and error, especially in the formative years of a class. As a teaching assistant at Stanford, I taught review sessions for which I spent a good amount of time preparing notes from several textbooks and coming up with realistic examples to drive home the point, teaser questions to bring out subtler points and increase interactivity in the class. The results were rewarding - the students loved the review sessions, the attendance was nearly 100%, students with backgrounds from diverse disciplines were appreciative of Networking, and the learning experience was fun for students and me alike.

The most important element in teaching is enthusiasm for the subject at hand. Much of my motivation for teaching comes from my enjoyment in what I do as a researcher. I have had a rewarding experience as a Teaching Assistant at Stanford. I had an opportunity to give many talks in industry and academia. Over time, I honed my presentation skills and became proficient on how to convey seemingly complex ideas in a simple way to a wide range of audience. I am prepared to teach a broad array of Networking classes – a basic Networking class for undergraduates, a more advanced graduate level class, as well as a seminar and project class that discusses the most recent advances along with an in-depth coverage of a few selected topics. Apart from that, I can also teach basic classes in Electrical Engineering and Computer Science such as Signals and Systems, Introduction to Probability, and Introductory Algorithms.