TEACHING STATEMENT

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Teaching is an art, and I really enjoy many aspects of it: sharing the joy of discovery and enjoyment of mathematics with my students, showing them the beauty and power of mathematics, working towards the ultimate goal of instilling a deeper understanding of mathematics into them, coming up with good problems and good solutions to increase their aptitude for solving problems in their respective fields, constantly practicing new methods for achieving these goals and getting them involved, and implementing fair techniques of evaluation. Throughout my graduate studies at Cornell University I have held a variety of teaching positions such as:

- teaching assistant (TA) for undergraduate and graduate courses (four semesters), where I was responsible for classroom recitations (usually four to six hours a week), setting homework and recitation problems, writing their solutions, and office hours;
- head TA (one semester), where in addition to the usual TA duties I was responsible for occasional lectures in the absence of the instructor, setting exam questions and writing their solutions, outlining grading schemes, distributing answer books among the graders and keeping track of all the grades.
- instructor for summer courses (two summers), which are offered for the M.Eng. and senior level undergraduate students, where I was responsible for syllabi, daily lectures, weekly recitations, office hours, setting homework and exam problems and writing their solutions, and grading;

Such diverse teaching experience has enabled me to enrich my skills and instilled confidence to be a successful instructor with my own effective teaching style. Students have written comments like "I wish this guy was a prof. I would definitely take a stat class from him. He brings clarity to probability.", "...readily available to help and really tried to make you come up with answers to homeworks by yourself, which was tough but helpful in the end ...", which are evidence of that.

Experience as a Teaching Assistant: My first formal teaching experience was in 2007 as a TA for ENGRD 2700. This is a course on basic concepts and techniques of statistics and probability for lower division undergraduates with different engineering major, who have never seen the subject before. After that I have been TA for ORIE 3500/5500, which is a course on engineering statistics and probability for upper division undergraduate and M. Eng. students, during Fall 2007 and 2008. I have also been a grader for ORIE 6320, a graduate course on nonlinear programming. As a TA my primary goal was to help the students develop skills which will be useful in solving problems of their respective fields. I also intended to demonstrate the key points and summarize the lessons, which they had learned during the regular lectures, to help them remember the essentials and appreciate the subject.

I always used to review the key points of previous week's lesson at the beginning of each discussion session. I took special care in finding out appropriate, interesting and numerous examples to describe all possible angles of a new concept. Instead of solving the problem right away, I used to divide the entire class into small groups and ask each of the group to answer some part of the problems. In this way even the weakest student of the class would feel welcomed, comfortable and smart. If some group couldn't figure out the right answer, I used to remind them of the relevant techniques gradually so that they can pick the right one. If a student didn't

seem confident, I used to meet him/her in one-to-one session to clarify the underlying idea. This method improves their problem solving ability.

The interactive way of teaching has got me excellent feedback. Many students have commented in the feedback that they learned the subject better at my discussion session than the regular lectures.

Experience as an Instructor: My most significant teaching experience was in the summer of 2009 and 2010 as the instructor of ORIE 3510/5510, which is an introductory course on stochastic processes for the undergraduates and M.Eng students. This is a six-week course with five lectures per week and is equivalent to the semester-long analogue. Here I intended to design the course to give equal importance to understanding theoretical results and applying that to real world problems in different engineering fields so that my appreciation for the subject percolates among the students. Since this was an intense course, the main challenge was to maintain a reasonable pace for the course, and making the students understand the material as well.

The primary job of an instructor is to create a classroom environment where the students feel at ease and do not hesitate to communicate. I always encourage my students to take part actively in discussions. During the lectures I often pose a question to my class which usually leads to an informal discussion of the problem at hand and also helps me to gauge level of the class which came in handy in the subsequent lectures. As a TA I had observed that students understand a concept better after first having some realization of why it is important or relevant. That is why whenever I introduce a new concept in class, I try to emphasize the motivation and the mathematical or real world context in which the concept fits in and use analogies to compare it with familiar ones. I also observed that simple example and visual aids (charts, graphs, computer simulation etc) at times help to absorb a new concept better. So I keep that in mind and use the above mentioned methods whenever necessary. I try designing assignments to cover the entirety of the topics taught, balancing theory and practice.

I am visually impaired. Keeping that in mind, I improvise my teaching to maintain a healthy student-teacher interaction. For example, I always encourage the students to speak up immediately if they need to clarify a point as it is impossible for me to gauge the student's reaction by observing their faces. I have also encouraged them to meet me after the class or come to the office hour in case of doubt when I can go over the problems with them individually. That helps me to personalize my teaching based on that individual students background and needs. As I can read only with a visual aid, I generally memorize my lecture and go through all the steps of an argument without referring to any notes, which students appreciate a lot. For that I prepare well in advance for my class and I present the material in an organized and methodical way. So my visual impairment has not become a hindrance to my teaching; in fact, it has turned me into a more effective teacher. I always encourage student feedback to understand the needs of the students as well as my shortcomings.

During and at the end of the course many students have stated that they really enjoyed my teaching. Some of them decided to pursue more advanced level probability courses, and later whenever I saw them, they said that the lessons that they learned is still helping them. During the summer 2009 course one of my professors attended two my lectures, and mentioned that my teaching was really good. During summer 2010 iteration of the course many graduate students audited the course, and came up with compliments like "very nice lectures", "fantastic examples and very helpful ideas".

Teaching is also an integral part of research and academic life, as it helps clarify and organize ideas through introspection and leads to a better understanding of a discipline. In future, I will be interested to teach any undergraduate course in probability and statistics, and graduate courses such as advanced stochastic processes, measure theoretic probability, point processes,

stochastic calculus, large deviation, random graph dynamics etc. Though teaching requires a lot of effort, I thoroughly enjoy the experience.