

# Teaching

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Not having to teach for most of my graduate school career has been a mixed blessing. I have had the luxury of focusing on research, but have missed the opportunity to help students gain new insights and grow into better scientists. I look forward to being a professor who can pursue teaching both inside and outside the classroom.

**Teaching Students in the Classroom** In my years as a student, teaching assistant, discussion leader, and guest lecturer, I have seen professors who were great teachers and many more who were not. In my experience, becoming a great teacher is not complicated, but it is hard. Two simple qualities necessary to be a great teacher are giving good lectures and assigning good projects.

I will bring the same determination and passion I have for giving technical talks to giving lectures. Giving a good lecture has a lot in common with giving a good technical talk. In both, the speaker needs to make the topic interesting and important. After providing motivation, the speaker faces the hardest part: delivering technical details clearly. In the past, I have spent a lot of time and effort crafting good technical talks. To me, it is very rewarding to draw the interest of an audience and to convey technical ideas crisply. I look forward to doing the same in the classroom.

I also plan to structure programming assignments so that students have to understand the actual problem being addressed. Programming assignments often focus on reinforcing the solution instead of the actual problem. The result, in my experience, is that most assignments can be completed without understanding the underlying lessons. What chance does a student have in appreciating how an algorithm solves a problem if he does not first understand the problem? I plan to tackle this shortcoming by shifting more attention to the problem. As an example of the kind of project I would assign, consider an assignment asking students to implement a replicated database. I would let students tackle the problem before discussing how to implement atomic commit protocols. When later required to implement 2-phase and 3-phase commit, the lessons that students learn would appear more real and useful because they have a deeper appreciation of the atomic commit problem to begin with.

I would feel comfortable teaching either distributed systems or operating systems classes, as well as introductory programming and data structures courses. With more preparation, I could also teach networking and security material, as well.

**Teaching Students to be Scholars** My goal as an advisor is to do more than just graduate students; I want to turn them into scholars. It will, in part, be my responsibility to help my students reach their potential and become more than they think possible.

Just as apprentices cannot become masters by perfecting one aspect of a trade, students cannot become scholars by only honing technical skills. Research taste, critical thinking, technical writing, and public speaking are also important skills. I have found reviewing papers to be essential in developing the first two skills.

Younger students have to be exposed to research that is great, good, mediocre, and bad. I plan on asking junior students to read papers that are in review and discuss their opinions with me. More senior students will write reviews before discussing submitted papers with me, reviews for which I will provide feedback. I went through this process and found it invaluable in developing research taste and in learning how to articulate my thoughts about others' work in a mature and scholarly way.

I will also devote a lot of time helping students to write papers and to design talks. I have seen program committees reject good ideas and conference attendees ignore interesting papers because of bad presentation. I believe both writing and speaking are critical to lifting a student from Ph.D. material to star material.

I plan to create a research group that while collegial also expects high quality papers and talks of itself. Such a group will help to achieve my goal of scholarship, and more importantly, maintain that goal. I am a better researcher because of my fellow students who have pushed me as much as my advisors have pushed. I believe a demanding yet friendly group is critical for long-term success and think the momentum of such a group could achieve more than I ever could alone.