As a professor, my goal is to train students to become independent engineers and research scientists capable of discovering interesting problems and developing novel and practical solutions. To this end, I plan to provide students with in-depth understanding of theoretical and practical systems; making abstract ideas more intuitive and helping them connect the dots to see the bigger picture. I will equip them with the skills, knowledge, and critical thinking needed to tackle challenging problems, come up with innovative solutions and test the practicality and usefulness of these solutions through proper implementation and rigorous experimental evaluation.

During my PhD, I developed and taught with my advisor a new graduate course on wireless communication systems. The class provides firsthand experience in designing and building wireless systems. I was responsible for conducting weekly recitations, preparing weekly assignments, designing and preparing the labs, grading, and teaching a few of the lectures. I find teaching very fulfilling especially when I see the excitement in the students once they have grasped them connect the dots to see the bigger picture. I will equip them with the skills, knowledge, and critical thinking with in-depth understanding of theoretical and practical systems; making abstract ideas more intuitive and helping them with them finish one task a time. I typically tried to start them on more conceptual tasks that challenge their intellectual and give them the chance to come up with their own ideas and solutions. This sparks their interest and gives them the confidence and the drive to push through the more tedious tasks of the project. Furthermore, I found it very useful to have regular discussions with the students and make sure they are not blocked on some task. Being blocked on a problem can frustrate students and make them lose the motivation to continue the project. I used these discussions to train them to expand their field of view and leverage concepts and techniques across research areas to come up with innovative solutions to the problem at hand and today they all lead their own successful projects. My experience taught me that once you show the students how much you are invested in the project, they become more invested themselves and willing to work harder.

Designing the labs for the above course was especially challenging. A lot of intricate details go into the design of a wireless system and it was not easy to decide how much of the system I can expect students to build on their own. I didn’t want to over-simplify the labs because the primary goal is to give students experience in building practical systems that deal with radio imperfections. So for each lab, I wrote a large skeleton of the code and divided the lab into tasks. In each task, the students were required to implement one part of the system. I then provided them with test code so that they can test the correctness of each task. This gave students a guideline for implementing each system and allowed them to conceptualize the interplay between the different components of each system. The labs also helped the students come up with very exciting research projects; several of which were later accepted at top networking conferences like SIGCOMM’14 and INFOCOM’15.

As a senior graduate student, I was entrusted by my advisor to run a large project on the applications of the sparse Fourier transform. I was responsible for mentoring junior graduate students and managing collaborations with other research groups. I also assisted in writing the NSF and DARPA proposals to secure funding for the project. Over a period of three years, I worked with six junior graduate students and collaborated with more than ten professors in different research areas. This taught me a lot about mentoring students and leading research projects. I found that with most students, it is very important to spend some effort at the beginning of a project to help them ramp up. Some students I worked with were overwhelmed with the complexity of a new research project. They didn’t know where to start and ended up wasting a lot of time on orthogonal or irrelevant sub-problems. Investing time to make sure they understood the basics and they were on the right track turned out to be very rewarding later in the project.

My approach while working with junior students was to organize the project into reasonable and achievable subtasks and have them finish one task a time. I typically tried to start them on more conceptual tasks that challenge their intellect and give them the chance to come up with their own ideas and solutions. This sparks their interest and gives them the confidence and the drive to push through the more tedious tasks of the project. Furthermore, I found it very useful to have regular discussions with the students and make sure they are not blocked on some task. Being blocked on a problem can frustrate students and make them lose the motivation to continue the project. I used these discussions to train them to expand their field of view and leverage concepts and techniques across research areas to come up with innovative solutions to the problem at hand and today they all lead their own successful projects. My experience taught me that once you show the students how much you are invested in the project, they become more invested themselves and willing to work harder.

Given my research and academic background, I can teach a variety of courses including computer networks, algorithms, wireless networks, and distributed systems as well as introductory computer science, systems, programming, discrete math and probability courses. Further, I would like to extend and offer the wireless systems course which I have developed. The course will use software radios to give students hands on experience with physical layer wireless design and to allow them to experiment with novel cross-layer networking ideas. Finally, I hope to use my experience, knowledge, and skills to continuously fuel my passion to teach and empower the next generation of researchers.