

# Ahmed Hareedy

## Teaching Statement

My passion for teaching is as great as my passion for learning and performing research. Teaching the younger generation makes me feel my impact on the future immediately. There are countless stories about students whose directions, and sometimes whose lives, changed positively because of their teachers. When I see the joy in the eyes of my students during lectures, discussion sections, or office hours as a result of understanding a concept, I do feel marvelous satisfaction about the noble job I am doing. It is really hard to find the same level of continuously renewed prompt satisfaction while doing any other job.

I want to design undergraduate and graduate courses, and teach them in a modern effective way that helps students grasp different concepts. My teaching strategy combines theory with application in an exciting way such that students learn the concepts and at the same time get equipped for the job market. I want to offer new courses connected to important and trending applications in order to help the department where I work stay competitive. I can teach fundamental courses, advanced courses in signals and systems, and also computer engineering courses.

**Fundamental courses:** I was the Teaching Assistant (TA) of the undergraduate course on probability and statistics in the Electrical and Computer Engineering (ECE) Department at UCLA in the winter of 2016 and the winter of 2017.<sup>1</sup> I was responsible for discussion sections, preparing homework assignments and projects, supervising their grading, preparing exam questions with the professor, and grading exams. I also had weekly office hours to directly interact with students and answer their questions. My goal was not only to help students understand the main mathematical concepts in probability, but also to strongly connect these concepts with engineering situations. I prepared many questions for discussion sections, homework assignments, and exams that are about probability in digital communications, computer systems, and other practical applications. In their evaluation of my efforts as a TA, my students rated me with the perfect median 9.0/9.0 in both occasions. Thus, I won the *Excellence in Teaching Award* from the ECE Department at UCLA in 2017. I like to teach fundamental courses on other topics, such as signal processing and linear algebra.

**Advanced courses in signals and systems:** I am interested in making these courses more interdisciplinary. I was an Instructor of the graduate course on modern coding theory with applications in data science in the ECE Department at Duke University in the spring of 2020. In this course, students learned modern coding techniques and applied them to applications including data storage, wireless communications, cloud storage, and distributed systems supporting machine learning. I taught the physics of data storage systems and the structure of distributed systems to motivate the coding techniques. Students learned algorithms and methods that are useful, not just in coding theory, but in many other fields. I developed projects of research nature in the course in order to capture the imagination of students. Currently, I am working with 4 of them on extensions of these research projects as well as new ideas, and we are writing papers together. My students rated me with the perfect median 5.0/5.0. Courses of similar nature not only teach students, but also prepare them for the job market after graduation. I like to teach advanced courses in signals and systems on other topics, such as information theory and communication systems.

Because of the ongoing pandemic, I had to teach the second half of the aforementioned coding theory course online. I gained significant experience in all aspects of online teaching, including lecturing, advising, and grading. I am well prepared to teach online as well as in person.

**Computer engineering and circuits courses:** Before starting my Ph.D. journey at UCLA, I worked 8 years at Mentor Graphics Corporation. There, I learned a lot about electronic design automation, analog circuit design, in addition to device physics and modeling. I also took a number of advanced electronics courses during my M.S. studies. Before that, the focus of my graduation project was to optimize, characterize, and test a reduced instruction set processor designed by Cairo University, which also allowed me to learn a lot about digital design and computer architecture. Because of the applications of my research (data storage, distributed systems, etc.), I am still connected with the latest in these topics. I recently gave a tutorial at the Flash Memory Summit, which is an important industry

---

<sup>1</sup>In 2016 and 2017, the department was still named the Electrical Engineering (EE) Department.

forum focusing on solid-state devices. I can teach courses related to all of the aforementioned topics. I can also collaborate with other faculty members to teach courses related to such topics.

In addition to teaching, I have a good record of mentoring students in their research. I contributed to hiring various undergraduate, M.S., and Ph.D. students at UCLA and at Duke University. I published with them and helped them achieve success in their following steps. I am still working with many of them until the time of writing these lines. More details about my mentoring efforts are in the diversity statement. I am committed to increasing and further diversifying my mentoring contributions in my new position.

This a list of the courses I like to teach:

**Fundamental courses:**

1. Probability and Statistics (Undergraduate).
2. Random Processes (Graduate).
3. Continuous and Discrete Time Signals (Undergraduate).
4. Linear Algebra (Undergraduate and Graduate).
5. Graph Theory (Undergraduate).
6. Linear Control Systems (Undergraduate).

**Advanced courses in signals and systems:**

1. Coding Theory and Applications (Graduate).
2. Information Theory (Graduate).
3. Fundamentals of Data Storage (Graduate).
4. Digital Communications (Undergraduate and Graduate).
5. Convex Optimization (Graduate).
6. Machine Learning (Undergraduate and Graduate).

**Computer engineering and circuits courses:**

1. Electronic Design Automation (Graduate).
2. Device Modeling and Simulation (Graduate).
3. Analog Circuit Design (Undergraduate).
4. Digital Logic and Digital Design (Undergraduate).
5. Computer Architecture (Undergraduate).