

TEACHING STATEMENT

Teaching and advising is a core mission of our profession as an educator. I am excited about teaching and enjoy the opportunity and the sense of achievement teaching brings to me.

Courses Taught

At Texas A&M, I have taught a variety of undergraduate and graduate courses on digital and logic systems, microprocessor systems, digital integrated circuit design, hardware machine learning systems, and VLSI computer-aided design over the course of 14 years. These courses differ significantly in terms of enrollment, advancement of materials (from the sophomore level to the advanced graduate level), and teaching style (from large lectures to interactive graduate seminars). Among these, I created six regular and special-topics graduate courses and helped revamp several others.

Teaching Philosophy and Approach

While teaching these courses, my teaching philosophy has centered on three pillars: *interactions and engagements*, *enhancement of problem-solving skills*, and *connection to the real world* (“big picture”). However, a specific approach is warranted for implementing this common philosophy for a given course.

Needless to say, preparation is the starting point of effective teaching. Apart from creating well-designed lecture materials, homework/project assignments and exams, I strive to create a friendly and stimulating environment. To all students, I believe a strong sense of care and respect creates a welcoming atmosphere that motivates learning and exploring. An important aspect of a good learning environment is the interaction between students and the faculty as well as that among the students. Such engagement shall take place both in and out of the classroom. The latter involves effective use of office hours and willingness of providing extra meeting times to serve the special needs of individual students, and creation of collaborative environment among all students.

There is no doubt that getting students well grounded in fundamentals is a key teaching objective. At the same time, I place a strong emphasis on the ability in understanding the technical background, formulating the right problem, and then solving it. To this end, elucidating the thought process behind course materials is an excellent way to stimulate the development of students’ critical thinking, which shall be further enhanced by well-designed homework and projects.

In our fast-paced world of science and technology, it is becoming increasingly important for our students to develop problem-solving skills while understanding the bigger technological and societal context. In my undergraduate and graduate level courses, I instill the “big picture” by connecting the course activities to the historical technological developments and the roadmap to the future. I have found that exposure to real-world challenges and practices serves the mission of engineering education well; it gives our students a sense of engineering pragmatism and broadens their horizon, and it energizes them to advance in education and career.

While following the same teaching philosophy, I approach undergraduate and graduate courses with different teaching styles and focuses. I believe in undergraduate teaching it is important to ensure that students develop a solid background and acquire essential problem-solving skills. This serves the two-fold objective of producing high-quality workforce and preparing our undergrads for advanced learning and research. Graduate level courses shall cater to the educational needs of students at this advanced stage. It is essential to expose graduate students to the latest development in the field, which necessitates timely updates of course content. Strengthening problem-solving skills under a complex technological setting takes an even more important role in graduate education. I consider this as a key outcome and a measure of success. Furthermore, I believe that building a culture and environment that values learning, exploring and innovating goes a long way to train high-quality graduate student researchers and can exert very positive influences on their careers beyond graduate school. My graduate level courses routinely integrate interactive discussions, student presentations, and open-ended class projects on less well-defined problems. These are effective mechanisms for helping the students develop skills necessary for applying and extending what they have learned from the course towards solving real-world problems.

Academic Mentoring

Advising, nurturing, and guiding students are essential elements of education and research team building. I have graduated 15 Ph.D. and 28 M.S. students (with thesis and defense). Furthermore, I have mentored 19 undergraduate students, and several post-doctoral and visiting scholars/students for research. As part of my mentoring, I strongly encourage my advisees to work on hard problems and develop internal drive for success. These elements are essential not only for the research project at hands and but also for the long-term professional development of the advisees. While a significant commitment from the faculty is always required to train top-notch researchers, I have found working with my students and research team one of the most rewarding aspects of my profession. In the past six years, I have been fortunate to win five best paper awards from major IEEE/ACM conferences with my graduate students.

Teaching Interests

I enjoy teaching courses in the broad areas of circuits and systems and algorithms at both undergraduate and graduate levels. More specifically, I have a passion in teaching introductory-level electronics, circuit theory, logic and digital systems, introductory-level computer architecture, CMOS digital IC design, VLSI computer-aided design, computational brain modeling, neuromorphic computing, hardware machine learning systems, and applied statistics and machine.