Teaching Statement Dipali Jain

"Tell me and I forget, teach me and I may remember, involve me and I learn," - Bejamin Franklin

I believe that meaningful engineering education begins with active engagement, practical application, and mentorship that meets students where they are. For example, digital and analog circuits are not abstract topics confined to textbooks, they are embedded in the systems that power our modern lives. Imagine how empowering it would be for students not just to use smartphones, but to understand how the circuits inside them function. As educators, we have the unique opportunity to spark that kind of curiosity to help students ask deeper questions and think critically about the world around them. My teaching approach centers on providing hands-on experiences, project-based learning, and inclusive practices that support students from diverse backgrounds. My goal is to help students gain not only technical expertise but also confidence, curiosity, and problem-solving skills that will carry into their future careers.

The transformative impact of embedded systems and IoT is evident in technologies we interact with every day from smart homes and wearable devices to connected vehicles and industrial automation. To bring these concepts to life in the classroom, I combine traditional instruction including chalk-and-talk sessions and visual presentations with project-based learning that encourages exploration beyond theory. During my time as a faculty member, I assigned group projects focused on developing small-scale IoT applications, where students implemented solutions using protocols such as LoRa, BLE, and XMPP. These projects not only fostered teamwork and system-level thinking but also deepened their understanding of communication protocols and networked architectures. In the Embedded Systems lab, I guided students through hands-on experiments using 8051, PIC, and ARM processors, integrating interfaces like keyboards, LED displays, and ADC/DAC modules. These experiences gave students the opportunity to design, debug, and build functional prototypes, strengthening their grasp of both hardware software co-design and real-world system constraints. I consistently found that students developed greater curiosity and confidence when they were empowered to apply classroom concepts to tangible outcomes.

In addition to Embedded Systems and IoT, I have been deeply involved in industrial automation education, an area where hands-on exposure is essential. I led the development of an Industrial Automation Laboratory equipped with Programmable Logic Controllers (PLCs), Distributed Control Systems (DCS), and a functional pilot plant with heat exchanger and reactor setups. This environment enabled students to learn automation concepts not only through simulation, but also by building, programming, and troubleshooting real process systems.

In classroom sessions, I emphasized ladder diagram programming for PLCs by drawing from real-world examples such as a three-floor elevator system and an automated drilling machine. Since students often found these applications challenging, I encouraged collaborative learning: they worked in groups, engaged in discussions, accessed book material, and presented their logic collectively to the class. This approach enhanced both their technical problem-solving skills and their ability to communicate solutions effectively.

To further bridge academia and industry, I organized industry visits and coordinated a week-long training program at Siemens, giving students first-hand exposure to industrial practices and modern automation tools. These experiences prepared them with industry-relevant skills in a safe, supportive learning environment. For these contributions and my student-centered approach, I was honored with Best Teaching Awards in consecutive years.

At the University of Texas at Dallas, I have continued to strengthen my teaching practice through diverse instructional roles. I have served as a Teaching Assistant for undergraduate courses such as Fundamentals I (introductory electronics lab) and Functional Verification, where I supported students in developing foundational circuit and design verification skills. I have also independently delivered classroom instruction in Applied Cryptography, stepping in to lead lectures and engage students in complex security topics. In addition, I have mentored incoming teaching assistants, helping ensure consistent lab delivery and fostering a collaborative teaching environment. In all these roles, I emphasize individualized student support whether through office hours, tailored feedback, or guidance on lab projects demonstrating my ongoing commitment to effective and inclusive teaching.

At the core of my teaching practice is a commitment to inclusive education and student mentorship. I strive to create a classroom environment where students from diverse academic, cultural, and socioeconomic backgrounds feel supported, heard, and empowered to succeed. I incorporate multiple modes of instruction that include visual aids, live demonstrations, guided discussions, and one-on-one mentorship to accommodate a variety of learning styles. I encourage students to ask questions freely, value mistakes as part of the learning process, and collaborate respectfully with their peers. Whether mentoring students on research-driven projects, preparing them for technical interviews, or guiding them through challenging concepts, I take pride in helping each student find their confidence and voice as an engineer. Many of my students, especially those who were initially hesitant or underconfident, have expressed how project-based learning and individualized guidance helped them grow both academically and personally.

Teaching, to me, is a profoundly noble profession, one that shapes the character, caliber, and future of individuals. I believe that great teachers emanate from a blend of deep knowledge, genuine passion, and unwavering compassion. Looking ahead, I am eager to contribute to foundational and advanced undergraduate courses such as Digital and Analog Circuits, Embedded Systems, IoT Applications, Control Systems, and AI for Engineers. I am also enthusiastic about developing new modules in hardware security and secure embedded design, areas that bridge my research expertise with pressing educational needs. Above all, I look forward to being part of a institution where I can help students discover their potential, build confidence through hands-on learning, and inspire them to become thoughtful engineers and problem solvers.