

Graduate Program Description:

UCLA MSEE, Integrated Circuit Design tract description:

Integrated circuits continue to play a central part in the evolution of the modern world. The growing desire to embed artificial intelligence in almost everything, the push for ever higher communication data rates and the emergence of exciting new applications — in health, defense, transportation, quantum computing and more — have only renewed the demand for integrated circuits of versatile functionalities and excellent performance.

The UCLA Samueli School of Engineering's Integrated Circuit (IC) Design area of study will equip students with the fundamental knowledge and the skills required to effectively address challenges such as novel devices, device variability, stringent performance requirements, integrated circuit complexity and mixed-signal solutions. The curriculum combines classical analog/RF and digital integrated circuit design with courses that emphasize modern mixed-signal techniques. Students are encouraged to specialize in digital IC design or analog/mixed-signal/RF IC design, but can customize their studies.

TABLE II
WORLD-CLASS ENGINEER ABILITIES

<p>I. Aware of the World (Cultural, environmental, ethical, market opportunities, competitive talent, work ethic, and motivation)</p> <p><i>Mixed signal IC design focuses not only on high-speed, but in low power and efficiency as well. The more efficient high speed circuitry is, the less power is needed to be generated, thus helping the environment. For instance, I have experience in integrating BMS ICs, focused on maintaining battery health for specifically EVs, and wish to work on designing them. Low power requires less battery manufacturing, and more powerful BMS ICs will result in better battery health, cheaper EV development, and less gas burned.</i></p>
<p>II. Solidly Grounded (Engineering training, historical and new knowledge, lifelong learning)</p> <p><i>I wish to study under professors and work in labs at UCLA to contribute to low power and high speed IC layout research, as well as publish work. Even when I graduate I wish to work at a private lab (specifically HRL) to continue to research and develop mixed signal solutions and share my findings with their sponsors.</i></p>
<p>III. Technically Broad (Multidisciplinary real world, recognizes alternatives and probabilities, system modeling, experimental design, psychologically prepared to address new problems)</p> <p><i>Mixed signal IC design requires a large understanding of not only digital systems and design (such as computer architecture, DSP, digital comms), but of analog design as well (control theory), and in high speed cases much RF knowledge. The widespread knowledge base does not just show multidisciplinary ability, but the ability to learn anything new to address new problems.</i></p>
<p>IV. Effective in Group Operations (Cooperates, effective written and oral communication, seeks advice, values time, business knowledge)</p> <p><i>I have had a large amount of experience in Cal Poly FSAE's team, being a member, a lead engineer, and in a management position. Each of these roles on the team has developed and strengthened different skills and abilities to become a valuable team member as well as a leader.</i></p>
<p>V. Versatile (Innovative, applies engineering to general problem solving and the greater economic good)</p> <p><i>I have had the ability to move around in different subsystems of the Cal Poly FSAE team to help solve issues with various subsystems not of my own, such as developing regenerative braking and battery models to help stay the most efficient team.</i></p>
<p>VI. Customer Oriented (Satisfy customers, recognizes global market competition)</p> <p><i>Cal Poly Racing is built on a Top-Down design cycle, with all design decisions being traceable to our main goal: to win the competition, down to scoring the most points, to specifically how each decision will impact our points for the competition. This is necessary for our sponsors, who wish to see us perform well with their logo on the car.</i></p>