

New semiconductor pilot program at UCLA prepares community college students for jobs in growing industry

Nicole Wilkins

Key takeaways

- A new workforce development program co-led by CNSI, UCLA Samueli and Pasadena City College aims to train California students for the growing semiconductor industry.
- The semiconductor program is built in two stages: a two-week training module for lithography and a monthlong full-time internship at an assigned lab.
- The federal government created the CHIPS and Science Act of 2022 to invest in American semiconductor manufacturing, research and design, and strengthen supply chains.

A new workforce development program co-led by the California NanoSystems Institute at UCLA, or CNSI, UCLA Samueli School of Engineering and Pasadena City College aims to train California students for the growing semiconductor industry.

Found in countless electronic products, semiconductors underpin some of the key technologies of the future, including artificial intelligence, quantum computing and advanced wireless networks. That’s fueling growth in the industry, with major players such as Nvidia Corp, Taiwan Semiconductor Manufacturing Company Limited and Broadcom Inc. fast becoming household names.

The goal of the Semiconductor Manufacturing Program Pilot: to provide critical hands-on training in the industry and help create a skilled statewide workforce that can support semiconductor companies.

The program is the final step in a three-pronged approach by CNSI and UCLA Samueli to address [workforce development](#) needs in California. With support from federal and state programs and donors, these programs work to enhance student engagement with industry partners and address the need for training that aligns with the needs of high-tech employers.

C.K. Ken Yang, professor and department chair of electrical and computer engineering at UCLA Samueli recognizes the broader importance of this work.

“UCLA being a public university, our mission is to service the larger community beyond just the students we admit,” said Yang, UCLA’s lead faculty member for the pilot program. “UCLA has a large number of community college transfers to UCLA, and they reflect the demographics of California as a state.”

This pipeline is important in addressing supply chain weaknesses. For example, the U.S. is heavily dependent on overseas suppliers, especially in Asia, when it comes to microelectronics. U.S. Commerce Secretary Gina Raimondo [has said](#) America buys 92% of its “leading edge” chips from Taiwan.

To combat these gaps, the federal government created the CHIPS and Science Act of 2022 to invest in American semiconductor manufacturing, research and design, strengthen supply chains, and invest in the U.S.’ future workforce.

“Currently there are not enough people to bring up and sustain semiconductor manufacturing in the U.S.,” Yang said. “Across the industry, hundreds of thousands of people are needed over the next several years. We need a heck of a lot of people, and in order for students to serve as capable technicians, engineers and future leaders, they need to have specialized knowledge about the processes going on and have physical experience in the lab.”

Yang partnered with Jared Ashcroft, a chemistry professor at Pasadena City College, to build the program.

Ashcroft, who knew of CNSI, UCLA Samueli and their participation in the Southern California hub of the Department of Defense-funded Microelectronics Commons, was eager to create opportunities for PCC and other community college students.

“These programs will give us the bigger picture of evaluation and research of training,” said Ashcroft, whose research background is in nanotechnologies. “We need the data in the long term because we need industry support — not just government support — to show that the return on investment exists for employers to participate.”

The semiconductor program is built in two stages: a two-week training module for lithography and a monthlong full-time internship at an assigned lab. Students receive a stipend to support them during the internship. For the inaugural summer pilot, 92 applications were received for 10 spots.

Yang and Ashcroft hope to increase the number of students and create a program model that can be used for the next cycle or technology. Similar semiconductor training programs are taking shape across the U.S.

“Our mentality has to change because what doesn’t work in the workforce is competition, and you can’t support students without funding and program development without funding,” Ashcroft said. “We are creating a support system to provide industry their workers and universities their transfer students.”

Colleges with students in the pilot program included El Camino College, Pasadena City College, Santa Monica College, UC Irvine, Moorpark/Ventura College and Mt. San Antonio College.

The UCLA Nanofabrication Laboratory (CNSI and UCLA Samueli), the [UCLA Center for High Frequency Electronics](#), the [UCLA CNSI Integrated NanoMaterials Lab](#) and [HRL Laboratories](#) were among the internship locations.



Marc Roseboro

Ani Hakobyan in the UCLA Nanolab.

Pasadena City College student Ani Hakobyan, who heard about the program during one of Ashcroft’s chemistry lectures, became interested in the UCLA pilot after learning that semiconductor manufacturing is on the rise.

A rising sophomore studying electrical engineering, Hakobyan wants to work in the industry after graduation. “This program is so beneficial because I am getting valuable experience,” she said.

After her training, Hakobyan was placed in the UCLA Nanolab for her internship. One of the lab assistants happened to be Amber Wang, an engineering student at UCLA — and a friend and former high school classmate. For Wang, who helped train Hakobyan on the UCLA Nanolab equipment, mentoring her friend was an added bonus.

“The opportunities are out there,” Wang said. “I tell other students ‘put yourself out there.’ Having this teaching experience as an undergrad has been so beneficial to my future career.”

For Hakobyan the experience cemented her goal of working in industry. “I gained a new perspective in this field,” she said. “I’m definitely going to pursue something in chip design and semiconductors.”

The pilot program will continue next summer, and data tracking will be analyzed over the next three to five years to look at student continued education and employment. From Yang and Ashcroft’s perspectives, UCLA has a unique opportunity to support the semiconductor industry through this Southern California university ecosystem.