CalTeach program prepares undergraduate students for careers in math and science education

The program blends majors within the School of Physical Sciences with California teaching credentials to empower the next generation of math and science educators.

Wednesday, May 07, 2025

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The 2025 UC Irvine CalTeach cohort gathers for a group photo to celebrate earning their degrees in the School of Physical Sciences in addition to a California teaching credential.

Picture Credit:
Isaac Membreno

“CalTeach is my second home,” said Nancy, a UC Irvine CalTeach mathematics student. Nancy enrolled in CalTeach after their older sibling, who went through the program, described it as a welcoming and accepting place and experience.

“Through CalTeach, I’ve seen firsthand how science education can be enriched through interactive, hands-on learning,” Nancy said. “When students are encouraged to explore and experiment, they begin to see science not as a list of facts to memorize, but as something alive, creative and full of possibility. That’s the kind of classroom I want to build."

CalTeach equips UC Irvine School of Physical Sciences students with the skills and confidence they need to lead as the next generation of science educators in California’s classrooms. The students who enroll in the program complete the standard curriculum in their respective majors while also pursuing additional work that earns them a teaching certificate from the State of California upon graduation.

Ellie Marsh, director of UCI CalTeach, described the critical need for this kind of program. “The percentage of current teachers in certain subject areas, including mathematics and physics, who hold a degree in that particular subject is low,” she said. “We provide future educators in such subjects with hands-on training and teaching experience in the form of a California teaching license, which is awarded in addition to the full bachelor’s degree."

This is rare, if not impossible, at other universities outside the University of California system. Most students pursuing teaching careers in secondary math and science have to do a post-baccalaureate or master’s program after their bachelor’s to obtain a teaching credential. If universities offer a credential in four years, it's usually only for elementary education.

“We are doing our part to decrease both the time and cost of gaining a teaching credential,” said Marsh.

Students enrolled in the program work side-by-side with classmates in their chosen major, but also have their own dedicated responsibilities and coursework centered around practical teaching experience. CalTeach students work with teachers at schools across Orange County to design, implement and instruct curated lesson plans under the guidance of an experienced supervising mentor.

If you visit the CalTeach on-campus space at UCI, it’s clear that the program keeps the needs of UCI CalTeach students front and center. The space – located in Bison Modular – has social and study areas equipped with teaching materials that students can borrow in order to facilitate effective classroom instruction, and a quick scan of the walls reveals hundreds of photos, each featuring the smiles of current and past students from throughout the years.

The space has been instrumental in shaping Southern California teachers. Kent Vi, a chemistry graduate from the 2014 cohort, credits CalTeach as one of the driving forces behind his success as a chemistry and physics teacher at Saddleback High School in Santa Ana.

“When I started teaching, there was a national transition into a new curriculum and set of teaching standards, which was met with a lot of resistance, especially at the school where I was stationed,” said Vi. “It helped tremendously to be a part of CalTeach, since we were all learning how to incorporate these new teaching standards at the same time with each other."

Vi expressed gratitude towards CalTeach for preparing him to face the ins and outs of the classroom environment. During his training, Vi studied various scenarios that might crop up during teaching. “We were faced with difficult, complex situations, just like teachers do all the time, and it’s not always clear what to do,” Vi said. “For example, how do you deal with a defiant student that stays on their phone during class, even after asking them to put it away? CalTeach gave us time to prepare for these realistic situations and effectively manage our classrooms.”

Both Marsh and Vi described the uplifting experiences that affirmed their commitment to educating the next generation of scientists. With a personal touch of excellence in each lesson, they describe the heartwarming feeling of illuminating a lightbulb deep in their students’ minds. “I’m constantly learning about my students and about what makes them them,” Vi said.

To address possible gaps in knowledge, Vi runs a game in which students form a circle and face each other in order to respectfully learn about one another's backgrounds and personal experiences. Such leadership and commitment to individualized learning helps Vi stand out as a mentor to his students and facilitates a calm and dignified classroom environment.

"Teaching is important to me because we're part of a community where we grow together. Students come from many different cultures with valuable ideas that they can each learn from," Vi said. "One of the most important things CalTeach taught me is to teach through a student-centered perspective. This makes for fun, effective lessons where students listen and respect one another."

CalTeach prepares the next generation of educators with practical experience in teaching and classroom management – but it doesn't end there. Current students form meaningful connections within their cohort and classrooms, obtain a California teaching license and grow as individuals responsible for mentoring future generations.

Marsh expressed her intentions for continued growth. "We are working with UC Irvine administrators to design majors within the School of Physical Sciences with more focus on teaching," she said. "What about other schools? We want to expand into engineering and computer science majors. UC Irvine and Berkeley are the only campuses that offer the full curriculum – we also want to refine the CalTeach program across the entire University of California."

In producing both skilled educators and compassionate mentors, CalTeach has transformed the lives of its students and aspires to continue to shape the future of STEM education across California and beyond.

"CalTeach is my community and my second home," Nancy reiterated. "It gives me the courage, clarity and classroom experience I need to become the teacher I've always dreamed of being."

This article was written by Ph.D. student Olti Myrtaj from the UC Irvine Department of Physics & Astronomy. Myrtaj is a 2024-2025 UC Irvine School of Physical Sciences Science Communication Fellow.

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