

# THE *Current*

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## **NSF-funded program supports and retains first-year engineers**

Attrition in undergraduate engineering students is an issue across the country, with some researchers reporting that close to 50% of those who start college as engineering majors have switched by the time they graduate.

In UC Santa Barbara's Robert Mehrabian College of Engineering, computer science professor [Elizabeth Belding](#) had been looking at student data in the early 2020s to discern how UCSB engineering students were faring. "The second year is when we start to see attrition," she said. During their first year, students primarily take general education requirements such as math, chemistry and physics, and only a handful of courses in their engineering major — so students may be leaving the major before they really get to experience it.

They also may not have had time to develop a community within their major to support them through these challenging early years, Belding said, and they might be leaving without seeing the many possible career paths that lie ahead.

"Engineering is hard, but it's also an incredibly rewarding field," said Belding, an associate dean and faculty equity advisor for the college. "And to give that up without having really understood what it could have been, that's a real lost opportunity."

To bridge that gap, Belding and her colleagues created the Integrated Networking, Scholarship and Peer Interaction for First-Year Engineers ([INSPIRE](#)) program, which recently wrapped its second year. Funded by the National Science Foundation, the program combines seminars that introduce students to the college, to potential careers and to each other with supportive mentoring along the way.

INSPIRE began in fall 2024 with 33 students in computer science and chemical engineering. In 2025, Belding and her team — chemical engineering associate teaching professor [Joe Chada](#), computer science associate teaching professor and vice chair [Diba Mirza](#) and assistant professor of technology management [Jessica Santana](#) — expanded the program to include electrical engineering, with a total of 58 students in the three majors. In fall 2026, INSPIRE plans to invite students from all five majors, with an anticipated cohort of 75.

Pre- and post-program surveys, Belding said, have shown measurable improvement in how students perceive their majors and think about the persistence needed to graduate as an engineer. Comparing 2024 INSPIRE participants with three recent groups of engineering freshmen who were not involved in the program, Belding and her colleagues found that the groups not participating in INSPIRE lost 10% of their enrollment by the second quarter of their sophomore year. “These are students who left the College of Engineering,” she said. Those in the INSPIRE program? “We haven’t lost anyone,” she added.

“To encourage the type of groundbreaking ideas UCSB students, faculty and alumni are known for, we need to be able to retain the students who will become our future engineers, particularly during the early challenges of their studies,” said [Umesh Mishra](#), dean of the college. “As researchers at UCSB, we thrive on collaboration, mentorship and connection — and INSPIRE offers our students access to these opportunities from the beginning.”

Incoming freshmen are invited to apply for the program; those accepted take a one-unit seminar in fall and winter quarters. The fall seminar, which meets weekly, focuses on how to navigate the university and includes pointers on study skills and visits from campus groups. In winter, guest speakers, some of them UCSB engineering alumni, share their career paths and experiences.

In the first quarter, the idea is to demystify the “hidden curriculum;” that is, “all the things you should know, but no one explicitly tells you about the college

experience,” said Chada.

That includes the importance and the value of showing up during a professor’s office hours. “You don’t need to be struggling to go to office hours. It’s one of the resources the university has and is part of the educational experience,” Chada said. “I think students have the perception that if they don’t have a question, they shouldn’t be there. So INSPIRE has a whole class on demystifying office hours and how important it is to make connections with professors.”

Mirza teaches many of the INSPIRE students in her first-year CS course. “The biggest win is watching groups of INSPIRE students come to my office hours together,” she said. “It tells me they are not only more comfortable reaching out to faculty, but that they’ve found their people early on.”

Several of these students have shown particular perseverance through both challenging coursework and academic and personal setbacks, Mirza added. “A few have even joined my research group, where they are actively contributing to improving pedagogy, building tools to enhance the student experience in CS courses, and thinking deeply about the role of AI in CS education.”

Belding noted that INSPIRE is designed for students who are less likely to have had exposure to this “hidden curriculum” before coming to UCSB, for example, a first-generation student whose parents can’t share how to navigate the university, or students who might not have college-preparatory resources at their high school. But any engineering major can benefit, she said. “INSPIRE is open to everybody.” During the seminar, students are put into peer groups within their major, led by a peer mentor — an experienced student who is farther along in the same major. These groups work together during the discussion-based seminar and also meet outside of class. Those who complete both quarters of the program receive a \$300 stipend.

When computer science major Pranav Gunhal got an email about the INSPIRE program the summer before his first year, the stipend was a draw, but the program he found was even better. Working with his mentor during small-group meetups with five other students, he was able to ask questions that he might not have otherwise, from how to graduate early to how to get involved with on-campus research. “It’s nice to have that personalized support,” he said.

With the guidance of his mentor and support of his peer group, Gunhal found his current position in the lab of assistant computer science professor [Jonathan Balkind](#).

His mentor, Gunhal said, “was going to make sure that I did what I needed to do to get a research position.”

Gunhal is one of the original INSPIRE students who has gone on to become a program mentor — another example of the program’s success, Chada said. “We believe that some of these mentors have really meaningful conversations with INSPIRE students, but you can only hope and wish that the mentoring is going as well as you think,” he said. “So, when the students are telling their side of the story as they interview to become mentors themselves, it’s really sweet to hear.”

Joaquin Del Pego, a second-year computer science major, is another previous participant who became a mentor. Arriving at UCSB in 2024, he recalled, “I didn’t really have a great initial outlet to have friends in computer science. Having an INSPIRE group created a built-in network.”

INSPIRE also opened up new avenues to pursue his interests. One INSPIRE friend told him about the [New Venture Program and Competition](#), which he entered; he also joined a team of several INSPIRE students to compete in UCSB’s Data Science 200-person hackathon. His INSPIRE peer group worked to gather data for technical interviews and to compile their resumes, which Del Pego used to land a summer internship at Shiftwave, a Santa Barbara startup.

Del Pego and others have made lasting connections. “You learn more about your professors, not purely just from an academic lens,” he said. “That helps a lot with building real connections. Those are people who you can turn to for letters of recommendation, but then they’ll also refer you to other research, or you can even get interested in their research. I’m in contact with three of the mentors from last year. I still text them to this day.”

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## **About UC Santa Barbara**

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