CALIFORNIA STATE UNIVERSITY
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Teaching the Entrepreneurial Mindset P4

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Laurie Haack (BS '79; MS '06), 2019 Visionary award winner, enjoys her role as Professor for a Day. Her aim is to guide the next generation of leaders and encourage more women to enter engineering fields.

CONNECTION

NEWS FROM THE COLLEGE OF ENGINEERING & COMPUTER SCIENCE

Issue Sixteen // Summer 2019

Engineering the Future of STEM Communicators

A poised young woman approaches a podium and begins to discuss her childhood. "The characters I admired most in TV shows always interfaced with computers – they were usually the smartest and most useful." She then philosophizes, "I always felt this need of wanting to help." With all eyes at attention, she continues, "It looked like computers were the strongest tool to use to help people."

Maria Diaz, a junior majoring in computer science, has just turned what could have been a dull presentation into an engaging conversation. As a member of the inaugural class of Cal State Fullerton's Engineering Ambassadors Network, Diaz's job is to promote STEM careers to potential ECS majors and the community.

Before becoming an Ambassador, Diaz would have been terrified to speak publicly. She would have relied heavily on a script, written on her PowerPoint. However, up until this point in her presentation, Diaz hasn't shown a single slide. She instead, relies on her story to get her audience excited about a career in computer science.

Diaz's future plans include using machine learning to combat sex trafficking. She knows part of her job will entail communicating to groups who don't understand computer science. Therefore, the skills she's learning are critical. She says, "I know more about what the ingredients are for an effective presentation."

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The Ambassador Pioneers

The Engineering Ambassador Network was founded in 2009 by Penn State University Professors Michael Alley and Karen Thole. The program aspired to improve the communication skills of young engineers. Alley knew that part of STEM careers involved giving presentations. Thole had an added desire to encourage more women to pursue engineering careers. Both knew that K–12 kids would benefit from hearing relatable stories told by college students. The program has the potential to not only inspire the next generation of STEM majors, but also to boost the marketable skills of current students. It's not surprising that it caught on quickly. To date, more than 30 universities across the nation and around the world are part of the Engineering Ambassador Network.

Enter the CSUF Ambassadors

ECS Interim Associate Dean Sang June Oh learned of the Engineering Ambassador Network through Caecilia Gotama (MS '86), a donor and member of the ECS College Leadership Council. The two attended a training session at the University of Nebraska in the fall of 2017. There, they watched a new crop of Husker Ambassadors learn presentation skills.

"The whole concept of how to improve an engineering talk is simple," explains Oh. "Don't use bullet points in slides. Lines of text cause audiences to read instead of listen." Instead, Ambassadors learned to engage with stories, large images, and no more than two lines of text per slide.

> "I understand now that a single presentation has the ability to move an audience, even for just a moment."
>
> **JAZMIN MARTINEZ**, ECS ENGINEERING AMBASSADOR

That means Ambassadors must actually engage audiences with personal stories. Laughing at this point, Oh says, "Many engineers are quite shy, but have the potential, with training, to be very engaging presenters."

In December 2018, Oh, Gotama, and program coordinator Christina Hernandez set out to identify and train Cal State Fullerton's first Engineering Ambassadors. They chose 14 students out of 60 applicants, based on criteria they gleaned from the Penn State program.

A Message from the Dean

Susan Barua
Dean, College of Engineering & Computer Science

The College of Engineering & Computer Science has always been known for providing students with the skills and experiences they need to become masters in their fields. But in today's rapidly evolving world, those who are truly successful are more than just exceptional engineers or computer scientists. Whether they start their own business, rise within a company, or work in government or academia, they are creative problem solvers and strategic thinkers who have an entrepreneurial mindset.

To foster this way of thinking in our students, we have hired our first Entrepreneur in Residence, Atul Teckchandani, who is a professor at the Mihaylo College of Business and Economics and has an engineering background. Over the past year, Professor Teckchandani has offered support and guidance to students looking to turn their ideas into marketable products or businesses.

This year also saw the start of CSUF's Engineering Ambassadors Network, which trained a diverse group of more than a dozen ECS students to speak about their majors and give presentations about STEM careers to prospective students and the community. Similar to our focus on the entrepreneurial mindset, our Engineering Ambassadors are developing skills that are helping to prepare them for their future careers.

Moving forward, our goal is to integrate these types of learning into our curriculum more broadly. By spring of 2020, ECS students will be able to get credit for a business course at Mihaylo College. And, we are looking at adding a business component as a requirement for senior design projects, encouraging students to enter startup competitions, and exploring corporate partnerships and mentoring opportunities.

So, as we celebrate our most recent graduates and welcome them to the ranks of our alumni, we continue to implement this bold new vision that will give our students an even greater competitive advantage in this 21st century economy.

The inaugural class of CSUF Engineering Ambassadors, led by ECS Interim Associate Dean Sang June Oh, includes 14 juniors studying civil engineering, computer engineering, computer science, and mechanical engineering.

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All Ambassadors had to maintain at least a 3.0 GPA and be able to commit to Wednesday night training meetings. The advisory team actively sought those underrepresented in engineering fields. Oh explains, "Only 18% of ECS students are female and 34.8% are Hispanic. The Ambassadors will help attract more of those students."

A New Year for the Engineering Ambassadors

Training began in January with a special guest – Penn State's EAN founder Michael Alley. During the first weekend bootcamp and through subsequent sessions, students worked to perfect 15- to 20-minute presentations entitled, "What's So Good About My Major." With each practice round, Ambassadors improved their eye contact, timing, and ability to connect with audiences. In April, the Ambassadors presented at the annual Welcome to CSUF Day. At each session, 30 to 60 admitted freshmen, transfer students, and parents watched as the teams of Ambassadors conveyed their passion for civil engineering, computer engineering, computer science, and mechanical engineering.

Junior computer science major Katherine Torres says the Ambassador program has made a difference. "I actually prefer relying on what I know to just reading off the slides," she says. "It forces me to be more confident in myself, and I am better off because of it." Junior Kyle Kulpa adds, "When you do enough research on a subject, it makes it a LOT easier to talk about on stage."

Oh is proud of their efforts, saying, "Students feel part of an elite group because they're inspiring the next generation of engineers." Junior Jazmin Martinez agrees, "I understand now that a single presentation has the ability to move an audience, even for just a moment." As the Ambassador program continues to thrive, the advisory team is looking outside CSUF for support. Schools and civic organizations can book an Ambassador for a presentation.

Corporate sponsorship opportunities are available and come with unique benefits. Oh notes, "Industries that partner with the Engineering Ambassador program will have the chance to engage with these high-achieving students."

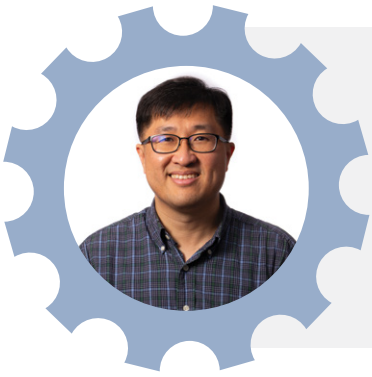
As it's uncommon for college graduates to come to jobs already able to create and deliver engaging presentations, the Engineering Ambassador program gives a real advantage in the job market, increasing career readiness and attractiveness to potential employers. Oh says, "Hiring an Ambassador would add value to any organization."

30+

universities are part of the Engineering Ambassador Network

3.0+ GPA

is maintained by Ambassadors



For more information about the ECS Engineering Ambassadors, contact Sang June Oh at **sjoh@fullerton.edu.**

"My goal is to help foster the kind of thinking that will help our students create and improve products and services, grow businesses, and excel in their careers – whether they end up being entrepreneurs or not."

ATUL TECKCHANDANI
ECS ENTREPRENEUR IN RESIDENCE

Teaching the Entrepreneurial Mindset

Atul Teckchandani, professor of management at the Mihaylo College of Business and Economics, started his career as a hardware engineer at a tech startup. Then he decided to switch gears, going back to school for an M.B.A. and a Ph.D. so he could teach students about entrepreneurship.

This combination of engineering and business knowledge made Teckchandani the perfect fit to become the first Entrepreneur in Residence at the College of Engineering & Computer Science. "The engineering and computer science students at Cal State Fullerton are very strong technically and have lots of great ideas," says Teckchandani. "Where they often need guidance is in taking those ideas and turning them into a successful product or business."

Teckchandani regularly holds office hours and offers workshops for ECS students to teach them concepts like design thinking and strategies such as the lean startup method. He asks students to think through different aspects of building a business – for example: who their competition is and how they will differentiate themselves, what their revenue streams will be, and how they will attract customers.

"One of the most important things I impress on the students is the need to involve customers from the beginning," says Teckchandani. "You may think you have a great idea, but you never really know how people will respond until you ask them. Talking to potential customers and getting a sense of what they want helps you refine your product and business model, and helps you avoid costly mistakes."

While not every engineering or computer science student is necessarily interested in starting their own business, the skills that Teckchandani teaches can be equally valuable to someone who wants to be part of a larger company, and move up through the ranks.

"You don't have to be an entrepreneur to have an entrepreneurial mindset," he says. "My goal is to help foster the kind of thinking that will help our students create and improve products and services, grow businesses, and excel in their careers – whether they end up being entrepreneurs or not."

Responding to student demand, Teckchandani is working to get two of the entrepreneurship courses at the business school cross-listed, at least one of which ECS students will be able to take for credit as part of their major. "ECS students have rigorous schedules," says Teckchandani. "I want to make it as easy as possible for them to gain exposure to concepts and problem-solving techniques that will help them take full advantage of their technical skills."

The Entrepreneur in Residence program is funded through private donations. The program launched this year, in part, due to the generous donations of ECS College Leadership Council Chair Kevin Carnino and support from Dean Susan Barua. Through increased support the college will be able to offer more programming and support additional student projects.

Laurie Haack (BS ’79; MS ’06)

The University Honors Visionary

Laurie Haack, software engineer, shares her experience building radar systems and designing software for U.S. defense contractor Raytheon. She enjoys interacting with the next generation of Cal State Fullerton engineers.

If you’ve ever wondered what difference a college degree can make, look no further than 2019 Vision & Visionaries award recipient Laurie Haack. Before attending Cal State Fullerton, she worked as a clerk typist for the Navy’s finance office. Today, she is the software product line manager for air and missile defense radar systems.

Haack entered CSUF in 1977 to pursue a relatively new engineering field. She says, “I was the only woman in my first computer science class.” A little over two decades later, Haack returned to her alma mater to pursue her master’s degree. Upon her graduation in 2006, Haack was honored as “Best Master of Science.” Shortly after, she was named one of CSUF’s “50 Women of Distinction” for career and life achievements.

Upon receiving the Vision & Visionaries award in February, Haack commented, “CSUF was a game changer. It moved me from a clerical career to software engineer.”

Haack has enjoyed a 40-plus-year career at Raytheon. “I’ve had many opportunities as an engineer. I’ve built everything from radars and radios to top-secret systems.” As she continues to support Raytheon’s internal innovation efforts, Haack acknowledges her alma mater. She says, “We hire Cal State Fullerton grads because they’re prepared for the workforce.” Currently, CSUF grads are working at Raytheon locations across the United States.

Haack visits CSUF often as a member of the ECS Leadership Council and as a mentor and participant in ECS Professor for a Day and the Leadership and Diversity Summit. She also serves on the MS Software Engineering advisory board. As a driving force behind the Women in Computer Science and Engineering program, the ECS Center for Cybersecurity, and the future Navigation, Controls, and Guidance Center, she has encouraged many of her colleagues to participate with her at ECS events. In the past 12 years, Haack’s fundraising efforts have resulted in gifts of over $475,000 for the college.

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“I am proud of what the College of Engineering & Computer Science is accomplishing,” explains Haack. “I am proud to support women in engineering and proud to be a graduate of CSUF.”

Established in 1994, the Vision & Visionaries awards are the highest honors that the University bestows on alumni and community supporters.

College News

NEW EXCHANGE PROGRAM

Congratulations, Innovation Fund Winners, from left: Scott Venezia (CETYS), Binod Tiwari, Yuliana Carrillo (CETYS), and Christopher M. Swarat.

"100,000 Strong in the Americas" is a new exchange program between Cal State Fullerton and Enseñanza Técnica y Superior (CETYS) Universidad in Ensenada, Mexico. The Innovation Fund grant, funded by ExxonMobil, allows 10 students from the College of Engineering & Computer Science and 10 CETYS Universidad students to travel to each other's universities. During that time, students will gain intercultural skills critical for today's global workforce by participating in lectures and presenting projects at an international research symposium.

The program is made possible by a grant from the ExxonMobil-sponsored Innovation Fund and matching funds from Cal State Fullerton. Binod Tiwari, professor of civil engineering and director of the immersion program, says, "This grant will foster an innovative curricular study abroad opportunity for engineering students, who will participate in well-designed, collaborative, and project-based learning experiences."

Student and Faculty Spotlight

Carina Coles' award-winning video explained the role of the Society of Women Engineers in supporting women in STEM.

Civil engineering major Carina Coles won second place in the Collegiate Video Challenge for her video that explained why CSUF's chapter of the Society of Women Engineers gives female students a place to learn, grow, and prepare for a career as an engineer. SWE plans to use the $300 prize money to support its STEM outreach program for Orange County Girl Scouts.

GeoWall Champs, from left: Cindy Deligiannis, Vanessa Antunez, team captain Jesse Solis, and Angel Martinez receive the national award.

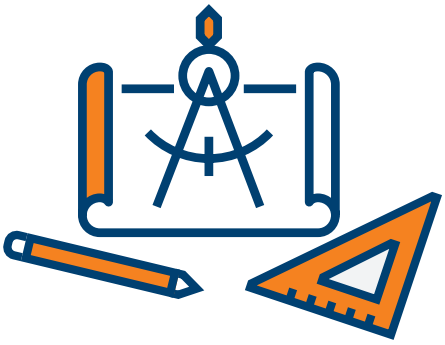
A CSUF team of civil engineers took the top prize in the 2019 GeoWall Competition, sponsored by the American Society of Civil Engineers' Geo-Congress. The win marked CSUF's fourth national title. The invitation-only competition challenged students to design and build a model wall made only of kraft paper.

Haowei Wang, associate professor of mechanical engineering, was recently named inaugural ECS Dean's Faculty Fellow. He will provide support for operational activities by assisting in planning, operation, and analysis of Graduation Initiative 2025, as well as academic programs, operations, internships, student projects, accreditation, website content management, and student data.

The future of cybersecurity includes CSUF students Jeffrey Guerra, Farid Aalam, Nikita Gupta, Allison Villapando, and Brian Wang.

A CSUF team of five computer science students took second place in the Technical Security Competition at Cal Poly Pomona, where they hacked into a fictitious company to expose potential vulnerabilities.

An interdisciplinary team of mechanical, electrical, and civil engineers joined forces to create a net-zero energy office building. Their design was accepted by the U.S. Department of Energy's Solar Decathlon Design Challenge. Even though the team did not win, CSUF was proud to represent the state as the only California university selected to compete.



Bryan Ruef's company, 10-8 Systems, won top honors in CSUF's Startup Competition.

As a full-time student, emergency medical technician, and fraternity treasurer, it seems that computer science major Bryan Ruef is busy enough. However, in January, the 21-year-old started a corporation with his brother – a corporation he entered in Cal State Fullerton's Startup Competition.

His company, 10-8 Systems, offers a cloud-based emergency dispatching system for public safety agencies. It is currently being used in over 400 municipalities by both public and private safety agencies. "It's incredible to know that my system is helping save lives," says Ruef.

Ruef's was one of 37 startups to enter the competition. In the first round, the field narrowed to 15, and ultimately to six. On April 19, the finalists presented their startups to a panel of industry-expert judges. Ruef took top honors. In addition to a $1,000 scholarship, he won a six-month residency at the CSUF Startup incubator. He says, "I plan on making the most out of the program to help 10-8 Systems grow to be the premier dispatching software solution."

Graduation 2019: Ready, Set, Go!

The College of Engineering & Computer Science celebrates the Class of 2019 – the newest additions to our distinguished alumni family! We look forward to your future achievements.

STAY CONNECTED

To change your information, visit ua.fullerton.edu/updatemyinfo

Support the College of Engineering & Computer Science.

Your gifts, your service, and your talent are fundamental to our goal of preparing graduates to solve 21st-century problems. ***Here's how you can get involved with the college:***

PLANNED GIVING AND DEFERRED GIFTS

Planned gifts can provide significant benefits to you and your family, now and in the future, while supporting generations of Titans to come. Consider including a bequest provision in your will or naming the College of Engineering & Computer Science at Cal State Fullerton as a beneficiary of your life insurance policy or retirement plan. Regardless of its size, your gift will make a difference in the lives of our students.

DONATE NOW
at giving.fullerton.edu

DONATE LATER
at csufplannedgift.org

VOLUNTEER OPPORTUNITIES

Share your career development experiences in the classroom, mentor an aspiring professional, or serve a department or program in an advisory capacity.

INDUSTRY PARTNERSHIPS

Connect the college with your company – we're continually seeking partnerships that provide student project support, internship, and employment positions for our graduates, targeted research opportunities for faculty, and industry links that help facilitate curricular currency.

CALL FOR GUEST PROFESSORS

Interested in sharing your professional experience with ECS students? Sign up to be a "Professor for a Day." Contact Michael Karg, senior director of development, at **mkarg@fullerton.edu** today.

For more information about getting involved with the college and gift planning, please contact:
Michael Karg | Senior Director of Development | 657.278.3348 | mkarg@fullerton.edu

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