

College of Engineering Mission & Vision

<http://engineering.ucdavis.edu/about/mission.html>
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Mission

Service to Society

Since its founding in 1962, the College of Engineering – in keeping with the UC Davis land-grant mission^{1*} – has focused on finding technical solutions to some of our nation's most challenging problems, while also preparing thousands of highly skilled engineers to join us in this challenge.

Research Strengths in Areas of National Need

Our researchers and educators focus on specific areas of concern: energy, environment, health and biology, information technology and management, and physical infrastructure. We are recognized leaders in energy efficiency, biomass, wind, alternative fuels and transportation, data visualization, optical communications, network security and biomedical imaging. Among the advancements in which our researchers provide leadership and expertise: electronic voting security, low-carbon fuel standards, plug-in hybrid vehicles, anaerobic digesters that convert organic waste into useable energy, imaging technologies that allow researchers to study biological processes at the cellular and molecular levels, regeneration and repair of cartilage and other tissues, nanomedicine and nanotherapeutics, and drug delivery systems that precisely target diseased cells.

Commitment to Training Future Engineers

With a long-standing commitment to undergraduate students, we provide strong engineering programs that balance scientific principles with practical applications in engineering design. These programs prepare students for entry into engineering practice, graduate-level research, and professional schools. We challenge our undergraduates to collaborate and communicate effectively, as they begin the process of lifelong professional growth.

¹ The modern land-grant university, first established by the Morrill Acts of 1862 and 1890, is committed to the idea that broadly accessible higher education should be within the reach of each state's residents, without regard for wealth and status. Land grant universities were granted public land and federal support for their mission to address society's most important challenges. There are 76 land-grant institutions in the United States, charged with serving society through education, research and public service.

Graduate Education to Advance Knowledge

We challenge our graduate students to join with our faculty and staff in advancing the understanding and application of a broad spectrum of modern science and technology. We are committed to being one of the world's foremost engineering research institutions while contributing to US technological leadership and striving to benefit global society.

Cultivation of Lifelong Learning

The College of Engineering educates each new generation of engineers to be critical thinkers and creative problem solvers who integrate, analyze and synthesize information in a way that fosters innovation. But the commitment to advancing engineering education does not end when degrees are conferred. In a world in which the pace of new knowledge increases by the second and change is the only constant, a commitment to lifelong learning is essential. The College of Engineering cultivates in its students an appreciation for and dedication to this truth.

Vision for Excellence

Building upon a long-standing tradition of public service, UC Davis Engineering has a visionary plan for the future in which innovative research and quality education will make life better for everyone.

In pursuing this vision we will continue to rise among the ranks of top-tier engineering research institutions in the nation. More than ever, we will be viewed around the world as a leader in advancing engineering knowledge, higher education and professional preparation. We will build upon key research strengths in the College and UC Davis and embark on new paths of discovery to identify socially responsible, innovative and economically and environmentally sustainable solutions to important societal problems.

The following goals are the framework upon which we will realize this vision:

I. Foster a Vibrant Community of Learning and Scholarship

Engineering technology touches nearly everything in modern life. The UC Davis College of Engineering has played a historic role in solving significant technical problems and embraces the responsibility to advance its leadership in engineering research and teaching for the future.

Engineers are dedicated to making life better for everyone. To serve that mission, we will engage the talent and creativity of our exceptional students, faculty/researchers, staff and alumni in addressing issues whose complexity and societal impact make them particularly challenging.

An Ideal Environment for Strong Collaboration

UC Davis offers an environment ideally suited to solving such problems—with a robust collaborative culture, key research strengths, and strategic partnerships with industry, government, scientists in other disciplines, and organizations around the world.

By forging strong partnerships, we also can more ably transfer research results and their benefits to the marketplace and the public.

A Comprehensive University

The College enjoys an ideal environment for engineering leadership and excellence as part of a comprehensive university that includes a graduate school of management, schools of law, medicine, education, veterinary medicine, and colleges of biological sciences, agricultural and environmental sciences.

The unique UC Davis concept of graduate groups provides a rich research and learning environment for addressing complex problems with teams of faculty and students from a broad variety of disciplines university-wide.

Across eight departments, 15 undergraduate majors and 10 graduate programs, The College offers diverse approaches to innovation and problem solving—precisely what is needed to address large, complex challenges.

Education Built on Fundamentals

The engineering education we provide is built upon a foundation of strong fundamentals, giving our students the tools that will enable them to grow, make creative discoveries, adapt to a quickly changing technical world and equip themselves for the life of continued learning that the speed of change demands.

Urgent Societal Needs

Today's world is connected by largely hidden but highly complex information networks. The speed at which this massively webbed data environment evolves is both exhilarating and daunting. Such technology has the power to unite us, can address some of our most difficult problems, and allows previously unimaginable human achievements. However, the complexity of our highly connected global community also makes us vulnerable.

There is an urgent need in California and the nation for engineers trained in information technology.

Medical, biological and chemical systems research has taken a leap akin to the profound advances introduced by the development of X-rays. Today's imaging and sensing technology allows researchers to probe the most fundamental components of living things, research

fundamental to fighting complex, serious diseases like cancer and to ensure the safety of our food supply.

There is increasing demand for engineers trained in biotechnology, skilled in exploration and innovation at the molecular, cellular, tissue, systems and organism levels.

The intricate physical infrastructure of the United States is aging and, according to a 2009 report by the American Society of Civil Engineers, needs an immense investment of resources to remain viable.

There will be an ongoing demand for highly skilled engineers who can apply innovative engineering solutions to sustaining and improving an aging infrastructure in a climate of increasing demand.

II. Drive Innovation at the Frontiers of Knowledge

Engineers are keenly aware of the interconnectedness of natural and human systems. Large, complex problems demand solutions that combine the best resources, expertise and experience.

We believe that interdisciplinary research—where diverse ideas and knowledge intersect—provides the richest seedbed for innovation and discovery.

A Robust Environment for Interdisciplinary Research

By nurturing and expanding upon this key UC Davis strength, we can foster an even more robust environment for interdisciplinary research. Expanded support for research and incentives for researchers who engage in multi-investigator, cross-disciplinary, activities and campus-wide initiatives, are all essential to advancing the College of Engineering to the uppermost level of engineering schools.

We will continually strive to increase support for research, provide opportunity for campus-wide initiatives, and reward principal investigators for involvement in multi-investigator activities such as research centers and groups.

Key Strengths and New Areas of Research

We will focus on advancing and empowering further discovery in our core research strengths:

- Engineering in Medicine
- Information Technology and Applications
- Energy, Environment and Sustainability

And we will identify and promote new areas of research.

This will necessitate de-emphasizing some areas to allow expansion in promising new areas of endeavor.

III. Embrace Global Issues

The interdependence of human and natural systems places particular demands on engineers, who must forge many of the physical and virtual bridges that connect the farthest points of this quickly shrinking world. It makes sense to approach technology research, innovation, application and education from a trans-national and global perspective.

The National Academy of Engineering outlined the Grand Challenges for engineering in the 21st Century, issues that often cross national borders and cultural divides, and can best be addressed with a holistic, global approach:

- Environmentally friendly power
- Access to adequate supplies of clean water
- Advances in health informatics
- Development of better medicines
- Reverse-engineering of the brain
- Improvement to the tools of scientific discovery
- Improved adaptive methods for learning
- Enhanced virtual reality
- Secure cyberspace
- Restored and improve urban infrastructure

IV. Nurture a Sustainable Future and Propel Economic Vitality

The history of engineering at UC Davis precedes by decades the formal founding the College in 1962, having established itself in the early 20th Century as one of foremost programs in agricultural engineering in the United States. Technology developed at UC Davis profoundly changed agriculture and contributed substantially to the economic health of California.

Today the College's diversity of expertise and discovery has an even wider impact on key economic sectors in energy, biotechnical and environmental technology, health, information technology and management and the physical infrastructure. UC Davis engineers are decision-makers, researchers and leaders in industry, government, research and higher education.

The College of Engineering will build upon its historic and current research strengths by playing a leading role in translating research innovations to the marketplace, by collaborating with key California industries, and advancing and sharing sustainable solutions that will have impact for the state, the nation and world.

V. Champion Health, Education, Access and Opportunity

The College is committed to achieving greater diversity in engineering, believing that inclusive, diverse professions are more capable of creating long-term, relevant answers to societal problems and building a world that works for all of us.

UC Davis Engineering ranks 3rd among the top 50 engineering schools in the nation for the percentage of women faculty. We attribute our success in increasing gender diversity among our faculty to a strategic effort to attract diverse pools of highly qualified candidates and to mentor and support new faculty.

The presence of these talented female faculty serves to attract women to graduate studies in the College of Engineering. The percentage of women in our engineering graduate programs is 28.5 percent women vs. 22.2 percent nationally.

Nevertheless, we envision a College of Engineering that more accurately reflects the diversity of California and the nation. Though the number of women and minorities in graduate programs in engineering has increased markedly over the past 40 years and continues to grow, there is much to do. The College will continue its efforts to increase the number of women and underrepresented minorities in our student body and faculty, engage in outreach activities to promote the unlimited potential of STEM (Science, Technology, Engineering and Mathematics) careers, and we will focus our educational programs to prepare our graduates for careers in a quickly changing, diverse global economy.

VI. Cultivate a Culture of Organizational Excellence, Effectiveness and Stewardship

The success of the College of Engineering's mission relies on the effectiveness, efficiency and stewardship demonstrated by its administrative practices. The College is committed to continuous improvement, streamlined shared services and reliable, transparent decision making.

Sound stewardship of resources relies upon a strong shared vision for the future, clarity in communications, community building and wide engagement in the plan that will lead to success.

All members of the College community who are stakeholders in the future—students, faculty, alumni and staff—must be effectively engaged in this plan in order to successfully advance the mission and vision of the College.

Staff play an important integral role in the research and education mission, contributing in many significant ways to the excellence of the College and the realization of the vision for the future. We are strongly committed to staff and to empowering the ongoing development of a talented, motivated workforce that is assured of its value to the mission of UC Davis and the College of Engineering.