

# UCI Excellence - Ideas, Ideals and Impact: The Samueli School Strategic Plan

*Developing Human Connections to Reach the Top 25 by 2025 –  
A Plan for the Next Decade*



*Prepared by*

## **Strategic Planning Team**

*Diran Apelian (Chair), Sharnnia Artis, Jean Bennett, Peter Burke, Robert M. Cassidy,  
Nancy DaSilva, Stanley B. Grant, G. P. Li, Huda Munjy, David Reinkensmeyer,  
Brett Sanders, Katie Tran, Lorenzo Valdevit and Jennifer Wilkens*

**February 28, 2017**

# Introduction

We are at a critical moment in the history of the Samueli School of Engineering at UC Irvine. The campus is under a mandate to grow, and the Samueli School sits at the cross-hairs of this growth. We must align with grand challenges, develop and strengthen regional partnerships and accommodate unprecedented student interest in engineering education. The campus envisions a build-out over the next five to 10 years, which means this will be the last phase of significant new growth. This implies that the Samueli School may have its last major opportunity to position programs to compete nationally and thus raise the rankings of the campus and its various schools and departments.

Since the Fall of 2011, the Samueli School of Engineering achieved significant growth and expansion despite challenges posed by a major university budget shortfall. It has hired or replaced 32 faculty, added 58 staff and increased enrollment by 712 (529 undergraduates and 183 graduate students). The school also established new facilities, research initiatives and centers in several areas such as water, materials and manufacturing. A positive indicator of the growing stature of the school is the caliber of faculty we have successfully recruited and retained, especially midcareer and senior faculty. This shows that the Samueli School affords both the academic and lifestyle opportunities that are valued by high-performing faculty and encourages high expectations for the caliber of future faculty.

Nevertheless, there is a little-discussed hurdle that must also be addressed at this critical time. Across the campus, but particularly in the Samueli School, growth opportunities introduce as much a feeling of angst as they do of excitement. High workloads from growth in student enrollments and research have stretched the capacity of many of our personnel. There is also a history of new initiatives starting at UCI while existing initiatives remain below critical mass with insufficient resources to compete at the highest levels. Among certain faculty and staff there exists a perception of a zero-sum game, and these faculty and staff are discouraged.

Indeed, historically, strategic plans have focused too much on the new things we need to do, and not enough on those things we already do well, which we must continue to build, as well as the support needed for this to happen. With this ultra-important “build-out” strategic plan, it is imperative that we address the fundamental tension that exists between the need to disproportionately invest resources in a few areas where we have an opportunity to achieve greatness – i.e., flagship programs with top-five rankings that draw unprecedented acclaim to the school – and the need to invest resources and realign personnel so all units are positioned for excellence. *Nothing short of excellence is acceptable in any area that the school chooses to pursue.*

Given this backdrop, the Strategic Planning Team explored the possible future for the Samueli School, with the goal of identifying those pathways that resonate with our lofty ambitions. This document is the culmination of this effort and centers around the multi-faced theme of *Human Connections*.

*What does this mean?*

First and foremost, *Human Connections* implies improved communications, coordination

and collaboration across the various units of the Samueli School. This is imperative for building a shared awareness of our strengths and weaknesses, and informing decision-making at all levels.

Second, *Human Connections* represents the signature element of all of our educational programs. We aspire to be the *#1 Personal-Public* university in the nation.

Third, *Human Connections* represents priority directions for both research and education: addressing societal grand challenges, such as water and energy sustainability, human health, advancing communications and mobility, and innovating new materials and technologies that stand at the foundation of economic growth, job opportunities and national prosperity.

Finally, *Human Connections* represents a mechanism by which we build and sustain excellence, including on-campus relationships among faculty, staff and students, and those off campus among alumni, employers, funding agencies, research partners and peers around the world.

The development of Human Connections, as described above, will improve the operational efficiency and morale of the school. It will focus our energy, resources and growth in the areas where we are poised for major impact, while maintaining our commitment to excellence in all that we do. We will elevate the visibility and stature of the school over the coming decade. Greater recognition will follow in the form of success of our graduates, awards and rankings. *We envision the Samueli School among the Top 25 by 2025.*

# Samueli School Challenges

A set of *Samueli School Challenges* is cast here in simple terms to organize our growth moving forward and to communicate our interests to a broad constituency of faculty, students, alumni, research partners, colleagues, policy-makers and community stakeholders – ranging from local to global. Our aspirations will inspire and encourage our partners to join us in the pursuit of these goals, and to publicly embrace our responsibility as a land grant university of the State of California to promote prosperity through advances in technology, reflecting knowledge and tools and the capacity to guide policy and practice. While these challenges are cast in the context of California, the impact of our work are known to extend far beyond state lines, especially given the leadership status that California holds as the fifth largest economy in the world and a trend-setter in many areas, including information technology, environmental protection, human health and lifestyle.

- Develop smart grid technologies, new transportation systems, energy storage systems, new materials, high efficiency alternative and renewable energy technologies, water management practices and conservation measures to *reduce greenhouse gas emissions 40% below 1990 levels by 2030*.
- Adapt California coastlines, the focal point of California culture and the tourist economy, to *accommodate 1 meter of sea level rise* while protecting coastal development and natural resources.
- Transform Southern California stormwater systems *to ensure water and ecosystem security* and minimize flood risk through three degrees of global warming and concomitant impacts on water resources.
- Sustain the nation’s largest manufacturing population by assisting manufacturers in the implementation of emerging *additive and smart manufacturing technologies* in Southern California through integrated research, education and industrial engagement.
- Transform mobility of people and goods by developing connected, automated, shared, integrated and zero-carbon mobility systems to enhance safety, efficiency and accessibility for all Californians, while meeting environmental and energy imperatives.
- Maintain California as the world leader in the high-technology economy through *advances in information and computing technologies* and communication systems.
- Develop minimally invasive, mobile and personalized biomedical technologies that advance a holistic paradigm of human wellness across California and make health care affordable for all Californians.

- Create the next generation of smart molecules and materials that provide personalized treatment by harnessing information available with novel platform technologies that assess the genetic, metabolic and physiological status of each person.
- Implement advanced biomanufacturing to efficiently convert biorenewable resources to fuels, chemicals and pharmaceuticals, and understand interactions among microbial communities that impact biomanufacturing, the environment and the microbiome.
- Develop new materials and materials systems that sustain and enhance key industrial sectors in California, including aerospace, defense, automotive, energy, health care and micro/nano-electronics. This can be accomplished through multidisciplinary research in advanced materials design & manufacturing, cutting-edge multi-scale materials characterization and computational modeling of materials, processes and in-service behavior.
- Establish the most diverse faculty, staff and student body of any UC research institution, thereby setting a clear example for success in this category.

In sum, we envision that four priorities will lead the excellence and growth of the UCI Samueli School of Engineering in the 21<sup>st</sup> century:

**(1) Harness engineering innovation for a climate-resilient, thriving California**

Develop smart-grid technologies, safe and efficient transportation systems, and renewable energy sources; and secure water supplies for humans and ecosystems while respecting the environment, anticipating climate change and promoting a thriving economy. Meet the state goal of reducing greenhouse emissions to 40% below 1990 levels by 2030, anticipate 1 meter sea-level rise while growing the coastal economies, and build resilience to floods and droughts under anticipated climate change.

**(2) Lead the new industrial revolution in technology and manufacturing**

Develop new materials that sustain and enhance key industrial sectors in California, including aerospace, defense, automotive, energy, health care and micro/nano-electronics. Assist manufacturers in the implementation of additive and smart manufacturing technologies through integrated research, education and industrial engagement.

**(3) Advance human well-being via a holistic and affordable approach**

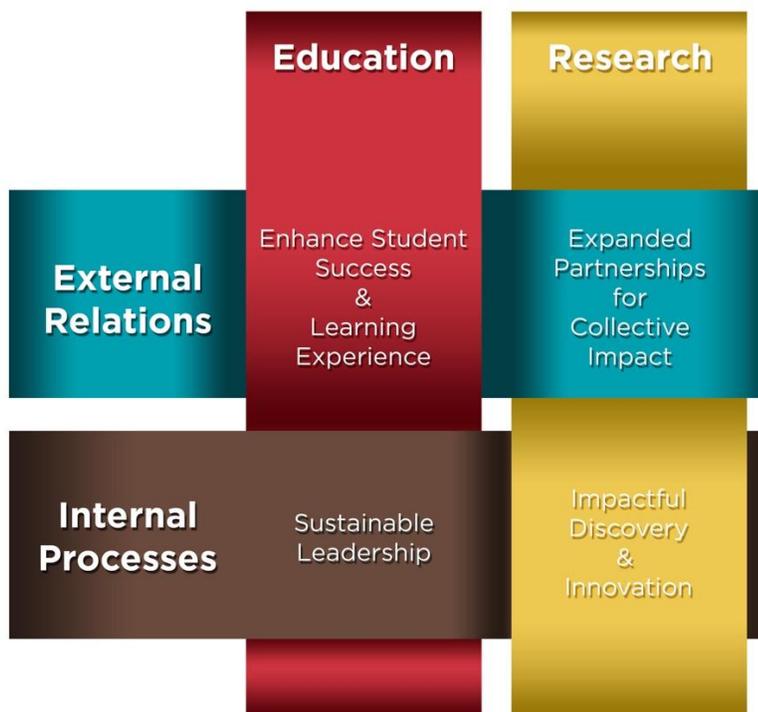
Protect and enhance human health by developing in a holistic paradigm to human wellness, biomedical technologies, early detection and affordable health care.

**(4) Provide thought leadership in engineering education and outreach**

Become a statewide and national leader in developing innovative ways to educate, attract and retain engineering students through the continued implementation of experiential learning.

**UCI Excellence embodies Ideas, Ideals and Impact.**

In the remainder of this report, we set goals and recommend strategies for the Samueli School along four inter-related areas: *Academic Advancement (Education)*, *Research (Dynamic Discovery)*, *Internal Processes (Lasting Leadership)* and *External Relations (External Engagement)* - see Figure 1. Whereas *research* and *education* represent the mission of the University of California and are fundamentally inter-related, *internal processes* and *external relations* represent cross-cutting support elements, which are arguably most important for positively transforming the atmosphere of the school and catalyzing the greatness which today is at our fingertips but not yet in our grasp.



**Figure 1:** Four interwoven pillars implement the vision to enhance student success and learning, and to discover and innovate.

***Mission Statement***

To advance engineering discovery through the creation of original scholarship and research applied to societal grand challenges, to educate and train the next generation of global engineering innovators, and to provide a technological edge to industry by facilitating technology transfer and talent acquisition.

## *Vision Statement*

We aspire to be among the preeminent engineering programs nationally, a top-25 school at the forefront of solving national grand challenges and cultivating knowledgeable, passionate engineers who are dedicated to solutions-oriented engineering.

## *Values*

We value a culture of excellence with an emphasis on:

Students – We put our students’ academic success and career readiness first.

Inclusivity – We provide a welcoming and supportive environment that respects and embraces diversity and individual differences, empowering everyone to learn and achieve their highest potential.

Resilience – We seek to enhance the ability at all levels of organization to create processes that are robust yet flexible and to use resources proactively in the face of disruption.

Innovation – We imagine the impossible in pursuit of novel solutions.

Globalization – We foster the knowledge, skills and experience to engineer the best solutions for the complexities of a global society.

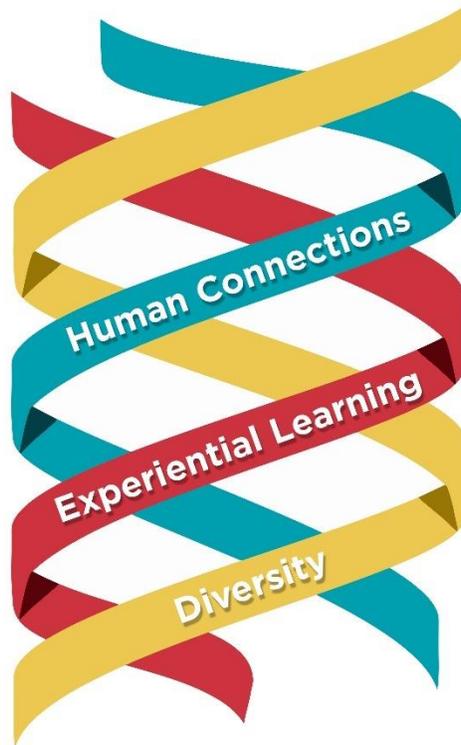
Service – We give back to society not only by engineering a better future, but by investing our time and resources in that future today.

Partnerships – We are committed to meaningful, collaborative relationships that contribute to the public good and advancement of the field.

Agility – We have the wisdom to ask questions and the courage to try something new.

Flexibility – We explore and stretch the limits of our imagination, creativity and engineering prowess to benefit mankind.

The DNA of the Samueli School of Engineering can best be described by the three chains of the triple helix: **Human Connections** – **Experiential Learning** – **Diversity**, as shown in Figure 2.



**Figure 2:** The triple helix of the Samueli School of Engineering represents our DNA.

## **STRATEGIC PRIORITY ONE: Academic Advancement**

### **Overarching Vision:**

UCI engineering produces accomplished Ph.D. graduates at a per faculty rate commensurate with the top engineering programs in the country, has growing professional M.S. programs, and supports an undergraduate program with excellent experiential learning opportunities and which leads the nation in promoting economic mobility.

*Building on these strengths, our overarching vision is to become the **premier public-personal engineering program**, internationally recognized for the innovators we train. We aim to do this by providing a globally relevant engineering education that is distinctive in fostering human connections and rich in experiential learning opportunities.*

### **GOAL 1: Provide a globally relevant engineering education that fosters human connections and offers a rich menu of experiential learning opportunities**

#### **Sub-goal 1: Enhance overall educational infrastructure to promote both graduate and undergraduate training**

- **Initiative 1:** Increase the number of faculty to 155 and lecturers with security of employment (LSOEs) to at least 10 to reduce student-faculty ratio.
- **Initiative 2:** Grow Ph.D. enrollment to 700 students and undergraduate enrollment to 3800 students.
- **Initiative 3:** Establish and execute a plan to explore different innovative pedagogies and facilities to change teaching and learning to promote a greater human connection and personalization of learning.
- **Initiative 4:** Establish and implement a plan for the rational and selective use of online education methods, including flipped classrooms, to promote greater human connection and personalization of learning.
- **Initiative 5:** Establish and expand indoor and outdoor student collaborative study spaces to exceed an additional 15,000 square feet. Further, every department should seek to establish, if possible, a graduate student meeting and socialization areas, following the example of the BME and ChEMS Graduate Student Associations.
- **Initiative 6:** Establish at least one new facility/building to accommodate student and faculty growth.

#### **Sub-goal 2: Enhance the diversity of students, faculty, and staff to reflect California's**

## **demographic trends**

- **Initiative 1:** Double the number of culturally relevant programs and initiatives, and enhance student support spaces that further expand an environment in which all can thrive academically and professionally.  
  
**Initiative 2:** Establish a national and local recruitment plan with quantifiable metrics for recruited and retained students to both attract and retain diverse, talented students, faculty and staff.
- **Initiative 3:** Develop *diversity action plans* at the school, department and center level that provide transparency of diversity and inclusion efforts by reporting outcomes using quantifiable metrics and relevant data.
- **Initiative 4:** Grow our populations of underrepresented *undergraduate* students to match or exceed the demographics of the three largest regions from where we draw our students (our Latino population should exceed 30%; our African American population should exceed 10%).
- **Initiative 5:** Grow our populations of underrepresented *graduate* students to match or exceed the national average (our Latino population should exceed 8.0%; our African American population should exceed 4.5%).

## **Sub-goal 3: Enhance UCI Ph.D. programs**

- **Initiative 1:** Increase Ph.D. support by 50% per department through increased research grant support; offer additional fellowships through fundraising; and increase fellowship support through innovative contracts with industry and foreign institutions.
- **Initiative 2:** A strength of UCI is its innovative, multidisciplinary programs that cut across the school of engineering and the entire university. To facilitate an interdisciplinary culture, each department should establish and support Ph.D. student leadership groups to organize research and social events focused on the major cross-disciplinary research thrusts of the school of engineering.

## **Sub-goal 4: Enhance UCI M.S. programs**

- **Initiative 1:** To increase global relevance and departmental funding for graduate studies, each department should seek to develop *at least one* self-supporting master's or comparable program in an area of high regional, national and/or international interest.
- **Initiative 2:** Many UCI M.S. students would like to complete research projects, but often faculty are not available to support these projects because of high demand in other areas. MAE has established an "M.S. Project" graduation route, which allows M.S.

students to engage in project-based learning without requiring a thesis-quality project or thesis-level review. Other departments should implement this or comparable options.

- **Initiative 3:** Departments should establish and affirm a mechanism for supervision of MS research projects by Ph.D. students, postdoctoral fellows and research staff.
- **Initiative 4:** UCI has a strong grass-roots internship program, with considerable participation. Expand, strengthen and formalize the current UCI engineering internship program to include M.S. students.

#### **Sub-goal 5: Enhance UCI undergraduate programs**

- **Initiative 1:** UCI leads the UC system in percentage of students involved in creative projects under faculty supervision. Continue to support, advertise and expand this achievement by 15% per year until 2022, (including UROP, SURP, Calit2, Global and other programs).
- **Initiative 2:** UCI engineering has one schoolwide undergraduate mentoring program. Establish at least two new programs to include more mentors from both industry and academic/research faculty, as well as peer mentorship.
- **Initiative 3:** UCI leads the UC system in offering an experiential freshman engineering experience. Formalize the freshman engineering experience and develop a plan to expand it into at least the sophomore year, so that students have the option to complete a major hands-on, experiential team project in each year, for each engineering major, culminating in Senior Design Review.
- **Initiative 4:** UCI has a grass-roots internship program, with considerable participation. Develop clear mechanisms to count and categorize the number of students engaged in internship programs. Develop collaborations with industry to expand and strengthen the current UCI engineering internship program by a minimum of 5% per year.
- **Initiative 5:** Grow the number of quality undergraduate teaching laboratories commensurate with the growth of the undergraduate student population.
- **Initiative 6:** Establish a voluntary e-portfolio for students, which resides on a UCI hosted web site and includes their personal mission and a graphical representation of their most significant project work.

### **GOAL 2: Establish new metrics to measure performance on execution of Goal 1**

Develop a strategic planning committee to annually evaluate progress toward the metrics and to establish new metrics, if necessary. For example, we might measure annually how confident graduating students are about soliciting recommendation letters to assess if we are truly a “public-personal” university. Or we might measure annually the quality of the UCI engineering internship

program, including participation rates, quality of experience and suggestions for improvement in order to assess how we are doing with our experiential learning activities. An “exit survey” from graduating seniors will assist in providing valuable input.

### **GOAL 3: Seek independent accounting of progress toward meeting the strategic plan**

Through an external evaluator and the existing committee, seek annual report card on strategic plan progress similar to reports currently provided by the Dean. With more open models for resources and responsive reporting throughout the school, this should be feasible with minimal administrative effort. Periodically reassess strategic plan based on progress and emerging opportunities.

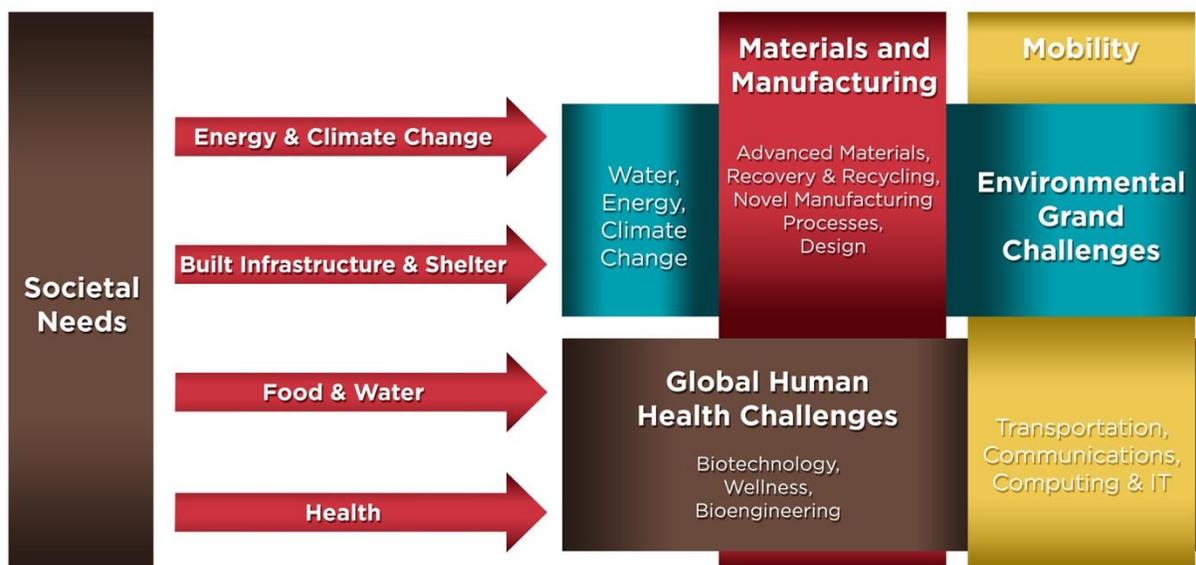
## STRATEGIC PRIORITY TWO: Dynamic Discovery

### Overarching Vision

In 2008, the National Academy of Engineering announced the Grand Challenges facing our society. The 14 Grand Challenges are well documented (<http://www.engineeringchallenges.org>) and cover a broad set of societal needs. However, focusing on the basic human needs for the 21st century, we believe the pivotal necessity is how to sustain the formidable developments and economic growth we are witnessing across the globe. Our cities, infrastructures, need for mobility and demand for natural resources, whether minerals, energy or water, are under intense pressure never experienced before. In addition, human health and environmental health are at a crossroads due to advances in technology in an environment with limited restraint from a policy and societal perspective. Engineers have a responsibility as creators of the modern world to address these daunting challenges.

*Over the next decade, the Samuelli School of Engineering will become one of the preeminent institutions in the world dedicated to the creation of knowledge and its application to societal grand challenges.*

### Sustainable Development for the 21st Century



**Figure 3:** Sustainable Development for the 21st century must address four basic societal needs. These are addressed through four interwoven pillars.

## **GOAL 1: Through investments in research, address the grand challenges facing society, specifically basic societal needs for sustainable development in the 21<sup>st</sup> century**

Tackling the key engineering challenges in this arena requires investments along two fundamental areas of need - see Figure 3:

- **Environmental Grand Challenges – *Water, Energy and Climate Change***
- **Global Human Health Challenges – *Biotechnology, Wellness and Bioengineering***

And requires investments along two technology platforms:

- **Materials & Manufacturing – *Advanced Materials, Recovery/Recycling, Design***
- **Mobility – *Transportation, Communications, Computing and IT***

*Water, energy and climate change* is a strength of the school; we have recognized and renowned champions, and it is a theme that is extremely well-represented on campus. Investing in this area has the potential to propel it into one of the best (if not the best) programs in the country.

*Biotechnology, wellness, and bioengineering* currently provides the largest fraction of research expenditures for the school. It is one of our strength areas and a major societal grand challenge, and investments are warranted to nurture and to ensure national and international prominence.

*Advanced materials, recovery/recycling, design* is currently smaller in size than the other two above, but has received substantial investment over the past few years (in terms of facilities and senior hires) and is very well-represented on campus; a further investment is likely to produce the largest proportional impact (i.e., dramatic improvements in ranking and research expenditures).

*Transportation, communications, computing, and IT* are vested in various departments and centers; we do have pockets of excellence. Mobility – whether it be through communications and software (autonomous vehicles), or through hardware (aerospace, autos, etc.) – will be an important societal need, and the Samueli School of Engineering is well poised for success.

### **Sub-goal 1: Determine and prioritize areas of investment**

- **Initiative 1:** Identify unique areas of opportunity within the broad scope described above, in consultation with faculty leaders in the school. The strategic planning team will lead this effort during the first half of AY 2016-2017. These areas will be chosen due to their potential for huge societal impact, the existence of a critical mass of resources (faculty and infrastructure) and the availability of extensive extramural funding opportunities. The strategic planning team has already identified the following potential areas as opportunities for strategic investment:
  - *Water, energy and climate change*
  - *Biotechnology, wellness, and bioengineering*

- *Advanced materials, recovery/recycling, design/manufacturing*
- *Transportation, communications, computing and IT*

It is important to state that the above areas “*belong*” to all the departments of the Samuelli School of Engineering. Faculty from all departments can and should be involved in these four axes; these are interdisciplinary areas of research. Moreover, we see it as a strength that different perspectives from different departments will come together and work together. Inclusion is a strength and an advantage, rather than the other way around.

- **Initiative 2:** Perform a gap analysis of the four areas above to determine specific areas of investment for new or replacement faculty.
- **Initiative 3:** Develop an action plan to promote the formation of *nimble research institutes* (or equivalent organizational structures) along these major areas to invest in emergent and/or interdisciplinary research. These institutes will be seeded by school support in exchange for seeking and obtaining federal, state and industrial funding and will achieve self-supporting status in three to five years. A transparent and sustainable process will be set in place for evaluating existing centers and assessing their relevance; those that are in decline will be closed down nimbly to allow those that can go from good to great to thrive.
- **Initiative 4:** Develop a plan for sustaining or sun-setting existing areas of excellence in the school to avoid wasting past investments, even when these areas are not aligned with the key focus identified above.
- **Initiative 5:** Develop a focused plan for investment in schoolwide research infrastructure. This includes possible strategic investment in key large facilities: materials characterization, manufacturing, robotics, bio-imaging, cybersecurity, etc.).

### **Sub-goal 2: Recruit and retain the most promising faculty**

- **Initiative 1:** Consider splitting ChEMS into two departments: Materials Engineering and Chemical Engineering. Over time a critical mass of at least 15 active research faculty is needed in each department. The opportunity of starting two new departments with a fresh culture would accelerate the rise to a top-10 ranking.
- **Initiative 2:** Add 30-40 new faculty members over the next five years, and institute policies for attraction and retention of top faculty, including a robust mentorship program and competitive salary at all levels (avoiding compression/inversion except when it is performance-related).
- **Initiative 3:** Implement policies and procedures in each department to increase or maintain our pace of inclusive excellence in the hiring of new faculty. Thus, 50% of our new hires should be women or underrepresented minorities.

- **Initiative 4:** Work with departments and active research faculty to establish at least two incentives and initiatives to grow the number of research professors by more than 50%.

### **Sub-Goal 3: Develop strategic partnerships that leverage school strengths**

- **Initiative 1:** Enhance relationships with industry by growing industrial-related research by 20% over the next five years. Make industrial research a key metric of the new associate dean for research. Develop a very strong relationship with industry, focused on applied research projects.
- **Initiative 2:** Engage donors to raise \$30-50M over the next five years towards buildings, infrastructure, research initiatives, scholarships, fellowships and programs.
- **Initiative 3:** The Samueli School of Engineering has the closest relationship with Applied Innovation of any UCI school with the only Faculty Innovation Fellow on campus. Expand the already close ties with UCI Applied Innovation for translational research by doubling metric-driven programs and initiatives aimed at helping faculty move their ideas to commercializable intellectual property.

## **GOAL 2: Provide for the success of the school’s research mission.**

To achieve our goals, major transformations in the “*way we do business as usual,*” meaning all internal process, must take place. These are presented below, and some are also repeated in strategic priority four titled: Laudable Leadership. The emphasis and the repetition is purposeful, as our internal operational mechanisms need to be transformed in order to be responsive to the needs of those who will execute the plan. Internal system impediments need to be addressed in order to deliver on the promise of “25 by 25.”

### **Sub-goal 1: Improve the expertise and accountability of school support units to PIs**

- **Initiative 1:** Restructure TEC to provide greater communication and engagement. This includes regular online financial status and projection reports to units, programs and PIs.
- **Initiative 2:** Enhance or restructure the Associate Dean for Research office to provide assistance with preparation of major research proposals and/or training grants.
- **Initiative 3:** Develop a suite of research-related marketing materials that will be provided to departments. Establish active honorific committees in each department to promote faculty scholarly activity.
- **Initiative 4:** Establish a website that will direct faculty to resources for research and instructional support.

- **Initiative 5:** Produce an annual research report that highlights outcomes and investment in faculty research.
- **Initiative 6:** Restructure the school's director of research development position to double the number of research opportunities provided to faculty.

**Sub-goal 2: Share in risk of developing research initiatives**

- **Initiative 1:** Develop a plan to provide assistance with preparation of short-fuse, high-probability-of-success research proposals.
- **Initiative 2:** Develop at least three initiatives to increase by 25% our win rate for center/training grants to boost research funding.

**Sub-goal 3: Provide regular assessment of research efforts to maximize long-term faculty investments**

- **Initiative 1:** Annually assess, report and discuss research initiative/program competitiveness using some simple metrics. Revise or eliminate research initiatives/programs as appropriate.
- **Initiative 2:** Provide for regular space utilization assessments, including impact on research. Set expectations for space efficiency. Offer resources to improve space quality and utilization efficiency.

**Sub-Goal 4: Develop initiatives to increase support for faculty research**

- **Initiative 1:** Establish a \$10 million endowment for Samueli School research.
- **Initiative 2:** Develop mechanisms to match PI and departmental support for post-doctoral scholars and research specialists to work on grand challenge research projects and magnify the impact of our most productive faculty.
- **Initiative 3:** Establish indirect cost return and research support assistance to the most productive faculty.
- **Initiative 4:** Develop a process to provide seed support to fund high-risk, high-reward research ideas by working with the departments and research units.
- **Initiative 5:** Develop a process to provide seed support to low-productive faculty seeking to jump-start research by working with the departments and research units.

**GOAL 3: Seek independent accounting of progress toward meeting the strategic plan**

Through an external evaluator and the existing committee, seek annual report card on strategic plan progress similar to reports currently provided by the dean. With more open models for resources and responsive reporting throughout the school, this should be feasible with minimal administrative effort. Periodically reassess strategic plan based on progress and emerging opportunities.

## **STRATEGIC PRIORITY THREE: External Engagement**

### **Overarching Vision:**

Innovate a sustainable and renewable partnership ecosystem involving local, state, national and international collaborators from both private and public sectors for enriching the student learning experience and empowering scholars to take on holistic research.

*Our vision is to be a model for partnership with industry, government and international institutions.*

### **GOAL 1: Create a renewable ecosystem of engineering champions to help the school meet the grand challenges facing society, by encouraging and engaging students from primary school thru post higher education**

#### **Sub-goal 1: Effectively engage the community in creating 21<sup>st</sup> century engineering students**

- **Initiative 1:** Engage and grow the existing Engineering Alumni association within and dedicate external relations staff to connect alumni and coordinate the efforts from departments to school and campus.
- **Initiative 2:** Collaborate with industry to double the number of career networking and professional development opportunities for current undergraduate and graduate students to develop their career goals and connect with alumni and/or industry partners.
- **Initiative 3:** Establish active industry advisory boards in each department and develop a mechanism for these boards to evaluate the academic curricula in each department and to identify the potential for commercialization of faculty research.
- **Initiative 4:** Double the recruitment and engagement of underrepresented STEM students (i.e., low-income, first-generation, underrepresented ethnic/racial groups, and females) via summer programs and a variety of outreach efforts in order to attract a diverse population to engineering, improve the preparation of entering students and better retain students through graduation.
- **Initiative 5:** Through integration of the newly acquired OC STEM, engage the community in the development of three new initiatives aimed at providing thought leadership through the establishment of STEM Community Ecosystems.

### **GOAL 2: Create a seamless integrated research platform from local to international collaborators, from both private and public sectors, to enhance impactful research**

**Sub-goal 1: Effectively engage the community in creating 21<sup>st</sup> century engineering infrastructure and research programs**

- **Initiative 1:** Work with each center director to conduct gap and SWOT analysis for each center of excellence and identify strategic partners for leveraging available resources for research platforms (e.g., PIRE).
- **Initiative 2:** Develop a plan to incentivize faculty and departments to build campus partnerships with other programs and research centers outside engineering.
- **Initiative 3:** Double the number of living laboratory projects that incorporate engineering research to validate efforts (e.g., SMART Grid at University Hills).
- **Initiative 4:** Establish 10 corporate partners who have an in-depth collaborative partnership with the School. These companies will receive concierge-like interactions in exchange for support of undergraduate programming and faculty research.
- **Initiative 5:** Recruit at least two additional strategic partners from industry and/or non-profits ("stakeholders") for each research center/facility on campus.

**GOAL 3: Seek independent accounting of progress toward meeting the strategic plan**

Through an external evaluator and the existing committee, seek annual report card on strategic plan progress similar to reports currently provided by the dean. With more open models for resources and responsive reporting throughout the school, this should be feasible with minimal administrative effort. Periodically reassess strategic plan based on progress and emerging opportunities.

## **STRATEGIC PRIORITY FOUR: Laudable Leadership**

**Overarching Vision:** Create and sustain a culture of leadership to generate collective-impact success by providing organization, processes and resources to promote trust, partnership and a shared sense of mission throughout the school. Faculty and staff are the most valuable assets toward meeting the school's ambitious strategic plan, and success depends on executing as a unified team.

*Our vision is to be the campus model for faculty, staff and administration interactions.*

### **GOAL 1: Establish a sustaining model for division of resources between new initiatives and existing activities**

#### **Sub-goal 1: Affirm existing activities that should remain priorities, and identify how they fit into a modified strategic plan, how best to organize them within this plan and resources they need in order to succeed or remain successful**

- **Initiative 1:** Develop a culture of listening, service and investment in employee and constituent issues. Establish an independent 'ombudsman' or external review process to catalogue faculty and staff feedback and recommend changes accordingly. Establish in-school, anonymous HR survey of employee satisfaction and employee dissatisfaction.
- **Initiative 2:** Develop processes to ensure that research and instruction are not competing unproductively for resources.
- **Initiative 3:** Maintain an inventory of all academic programs (faculty cluster level) and staff support units and provide a two-way assessment every two to three years. Focus should be on both potential (grow, maintain, attend) and performance (high, medium, low).

#### **Sub-goal 2: Include constituencies in structural changes; ensure they are provided with a safe opportunity to provide input and are invested in the resulting decision**

- **Initiative 1:** Improve internal communication within school and with campus leadership. Faculty and staff should feel they are a trusted and respected part of decision-making.

#### **Sub-goal 3: Provide resource transparency and predictability so that decisions made throughout the school will result in space, staffing and budgets that reward achieving goals and taking initiative**

- **Initiative 1:** Provide regular reporting on resources to faculty and departments including clear documentation of how resources are allocated from campus and school.
- **Initiative 2:** Ensure that all report recipients are aware of changes in space, staffing, and budget models.

**Sub-goal 4: Increase human connection among faculty and staff to build respect, commitment, and cooperation**

- **Initiative 1:** Restructure the most challenged organizations, deploying different staffing and organizational models to improve connections. Develop a list of best practices related to organizational effectiveness.
- **Initiative 2:** Increase opportunities to share credit and be rewarded for team effectiveness and generating school success.

**Sub-goal 5: Position staff for excellence**

- **Initiative 1:** Develop a staff management plan that manages staff levels for optimum execution and aligns staff levels with school priorities and strengths.
- **Initiative 2:** Establish a staff advisory council that will proactively communicate with the faculty and administration.
- **Initiative 3:** Establish a matching fund that will allow staff to increase training and opportunities for staff development.
- **Initiative 4:** Take an inventory of similar schools and other academic units on campus and implement best practices for accountability and reporting.

**GOAL 2: Provide organization and support for the success of the school's educational mission**

**Sub-goal 1: Ensure adequate instructional resources and improve staff expertise**

- **Initiative 1:** Identify staff and faculty resources that can work directly with faculty on the development of online/hybrid/non-conventional courses.
- **Initiative 2:** Provide for regular space utilization assessments including impact on instruction. Set expectations for utilization. Offer resources to improve instructional quality and utilization.

**Sub-goal 2: School support units and academic units should work together to improve their relationship so that both organizations can be seen as beneficial partners for improving instruction. Provide nimble support units for program and content**

## **development**

- **Initiative 1:** Establish a report card to determine how units are specifically providing resources and supporting educational technology and student project support.
- **Initiative 2:** Create one or more units to support alumni tracking and engagement within departments, undergraduate and graduate career development and internships.

### **Sub-goal 3: Share risk in developing new programs.**

- **Initiative 1:** Identify staff and faculty resources that can temporarily integrate in academic units to develop self-supporting programs, including financial planning.
- **Initiative 2:** Develop a website that provides resources and structure for faculty developing promising self-supporting programs.

## **GOAL 3: Seek independent accounting of progress toward meeting the strategic plan**

Through an external evaluator and the existing committee, seek annual report card on strategic plan progress similar to reports currently provided by the dean. With more open models for resources and responsive reporting throughout the school, this should be feasible with minimal administrative effort. Periodically reassess strategic plan based on progress and emerging opportunities.

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