





# The UArizona Division of Agriculture, Life and Veterinary Sciences, and Cooperative Extension

## **Our Ecosystem: University of Arizona, its Strategic Plan and Arizona Board of Regents Strategic Goals**

The **University of Arizona** (UArizona; est. 1885) is the only land-grant, NSF research 1, Hispanic- and American Indian and Alaska Native-Serving university with two independently accredited medical schools and a member of the American Association of Universities. Its estimated annual economic impact to Arizona is \$4.1B.

The **UArizona strategic plan** is inspired by the 4<sup>th</sup> Industrial Revolution (4<sup>th</sup>IR) – our time in human economic development characterized by augmented machine intelligence fusing digital, physical and biological engineering. The plan aspires to develop innovative, adaptive learners and disruptive problem solvers who are prepared to lead meaningful lives and improve society in an ever-evolving world.

**UArizona Purpose:** Working together to expand human potential, explore new horizons and enrich life for all.

**UArizona Mission:** We will continuously improve how we educate and innovate so we can lead the way in developing disruptive problem-solvers capable of tackling our greatest challenges.

**UArizona Vision:** To create a world where human potential is realized and we're all working together to create solutions to big problems, so that life in our communities, in Arizona and on our planet can thrive.

### **UArizona Values**

- Integrity
- Compassion
- Exploration
- Adaptation
- Inclusion
- Determination

The plan's five pillars are to work in concert; each with initiatives, goals and key performance indicators which guide us when delivering our share of the task.

Pillar 1: Wildcat Journey

Pillar 2: Grand Challenges

Pillar 3: Arizona Advantage

Pillar 4: Arizona Global

Pillar 5: Institutional Excellence



# Strategic Plan

*Division of Agriculture, Life and  
Veterinary Sciences, and Cooperative  
Extension*

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The plan concurs with our 1862 land-grant university enduring purpose to benefit America's economy through: quality higher education in STEM and the liberal arts, research and then Cooperative Extension to and for all Americans regardless of race or economic status. So even though axiomatically the university plan was consistent with our own existing strategic plan, we reviewed and revised ours between August 29 and November 12, 2019, to ensure it comports best with today's economy as well as the university plan.

The UArizona strategic plan must itself concord with the **Arizona Board of Regents Strategic Goals** which also guide us when delivering our share of the task and are to:

- 1. Drive Student Educational Success and Learning** – Deliver a high quality university education.
- 2. Advance Educational Achievement Within Arizona** – Lead the effort to increase the number of Arizonans with a college degree or certificate.
- 3. Discover New Knowledge** – Create new knowledge, collaborations, inventions, and technology to solve critical problems and enhance lives.
- 4. Impact Arizona** – Engage and serve our communities through initiatives, and partnerships focused on supporting, improving, and enhancing Arizona's economy and competitiveness.

Our *Strategic Plan Alignment Rubric* (sent to Provost Liesl Folks on November 8, 2019) shows how the ALVSCE strategic intents, as well as its overarching, mission area, and academic unit strategic plans align with the UArizona Strategic Plan.



**Strategic Plan**  
*Division of Agriculture, Life and  
Veterinary Sciences, and Cooperative  
Extension*

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**Table of Contents**

**Our Ecosystem** .....i

**Letter from the Vice President**.....1

**Division Overview** .....5

**Environmental Scan** .....8



## Executive Summary

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The University of Arizona's Division of Agriculture, Life and Veterinary Sciences, and Cooperative Extension is comprised of three components: 1) the university's STEM College of Agriculture and Life Sciences (CALs), which delivers on agricultural, commerce, environmental, life, and many social sciences; 2) the university's Cooperative Extension System; and 3) the Arizona Experiment Station.

The division's strategic plan is focused to allow us to be **resilient, regionally responsive** to our stakeholders and **globally relevant**.

We must be more innovative, entrepreneurial, flexible and nimble when addressing both the practical problems of society and the basic science challenges that underpin new knowledge generation. We need to accept risk as part of our management and leadership norms. We will employ a "Deming cycle" of continually reviewing what we are doing so that we can change as soon as we see a better path forward.

The Great Recession signaled our new normal, accelerating changes in, and the coalescence of, computation, biology and engineering that have since been branded the "Fourth Industrial Revolution" (4thIR) by the *World Economic Forum*. This 4thIR has become the central tenet of the UArizona strategic plan. We have always known that we need to be where the world is going, not where it is today, and so we're well-placed to deliver for the UArizona in its 4thIR strategic plan.

We know we face, and need to be responsive to, rapidly changing technologies, delivery models, age and demographic diversity, and state demographics, because we always have been.

We know that today's graduates will have multiple jobs.

We know how to create new energy sources, more efficient water and energy use, how the value of food and food production will increase, how family structures and economies are changing amongst many other things. These, and others in the following pages, are key specific areas that we positively influence and impact, especially for our region and global regions like ours.

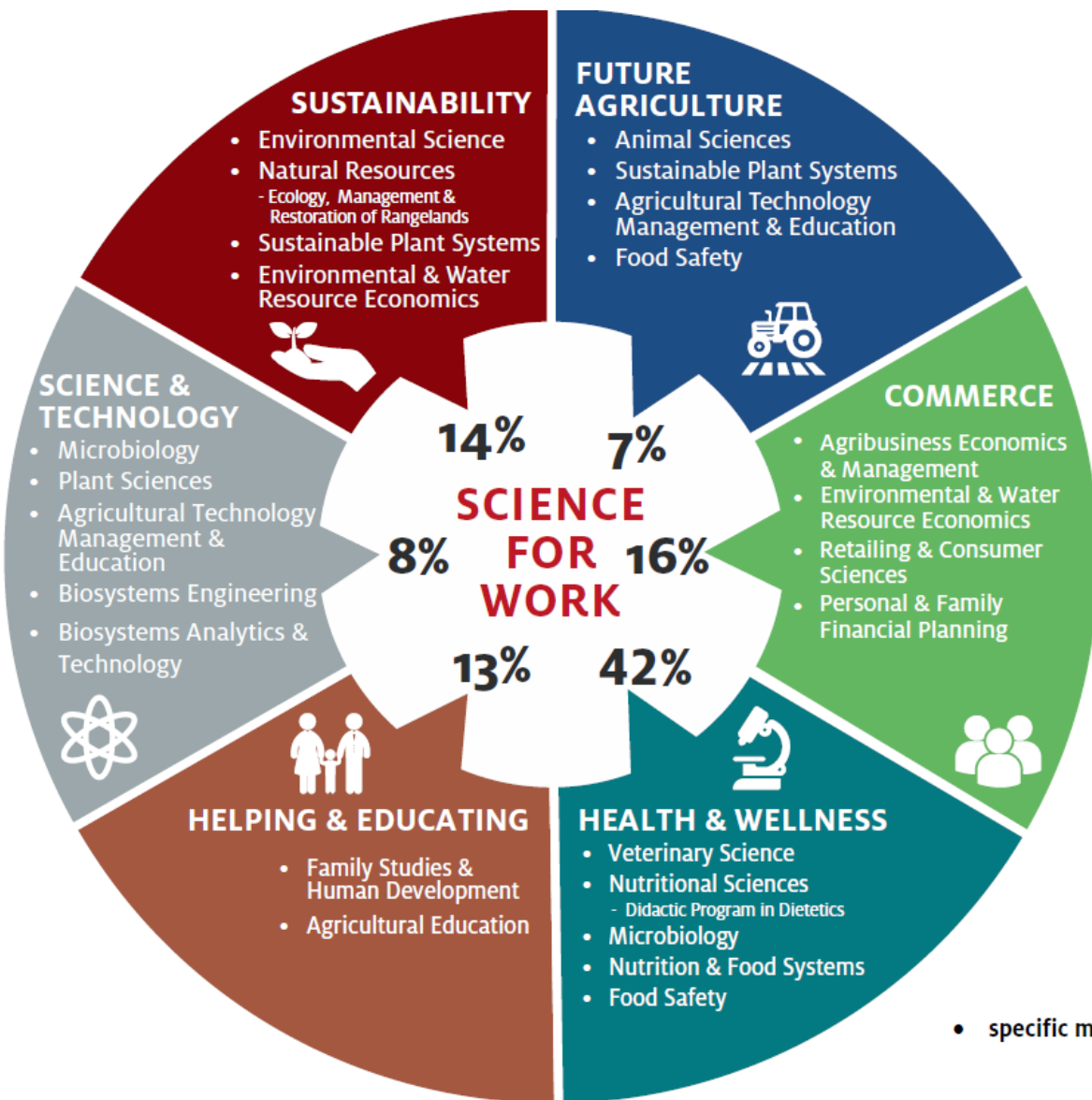
We will deliver **resilience through integrated systems** with five interconnected components:

- Arid and Semi-Arid Region Agriculture and Environment
- Individuals, Families, Communities, and Organizations
- Globally Oriented Basic and Applied Research
- Border Commerce
- The Bioeconomy

CALS is Arizona’s land-grant university’s (LGU) founding college. Historically fulfilling our missions meant we created new people and new knowledge for a new economy. This is the core of the nation’s land-grant universities and is as relevant today as it was in 1862 when the Morrill “land-grant university” Act was signed.

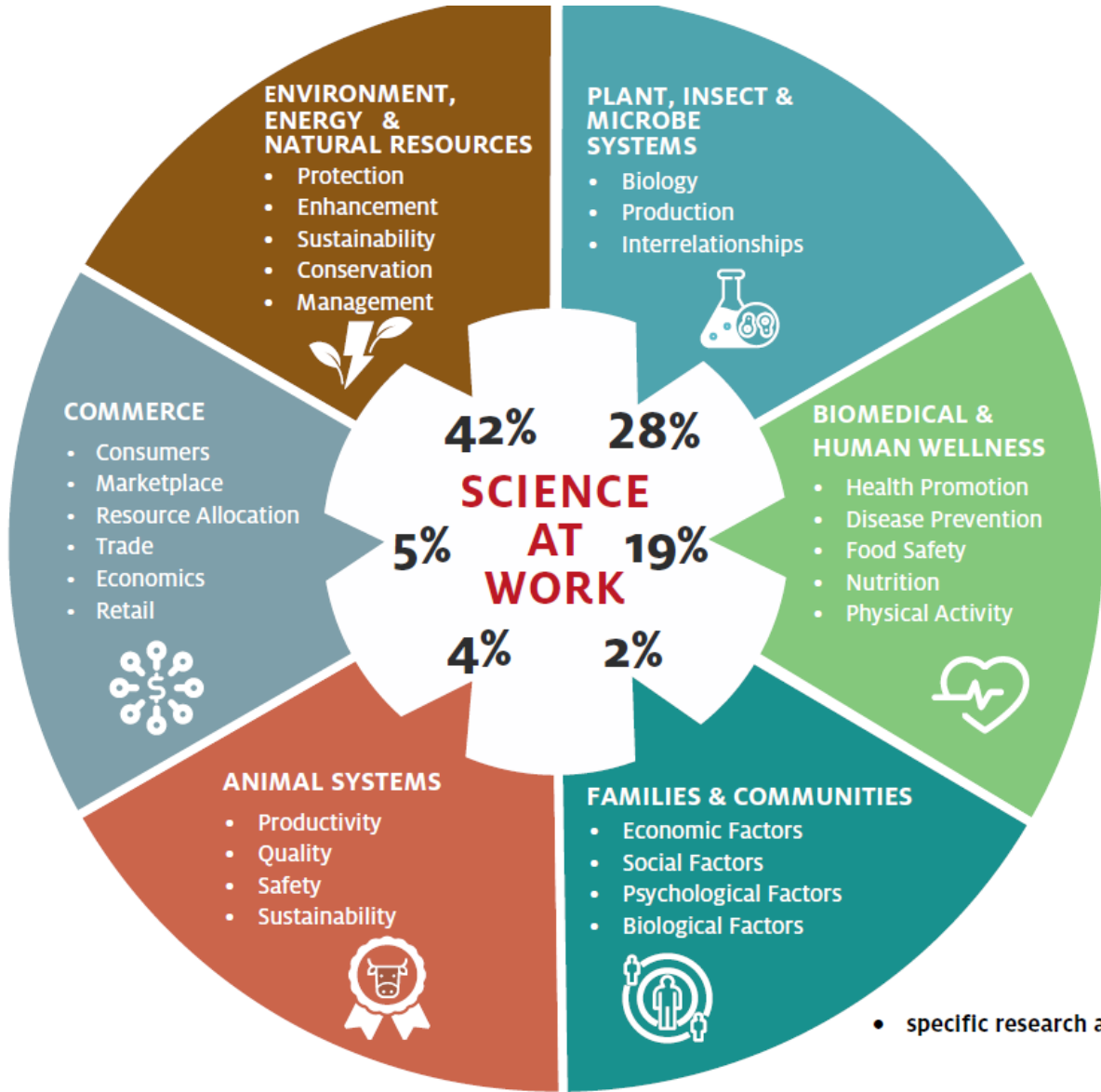
Like every LGU, CALS has academic schools and departments that deliver **teaching** and **research**.

CALS teaches science for work in six distinct, yet interconnected and interdependent economic areas (upper case; degrees in lowercase; percentages are undergraduate major proportions):



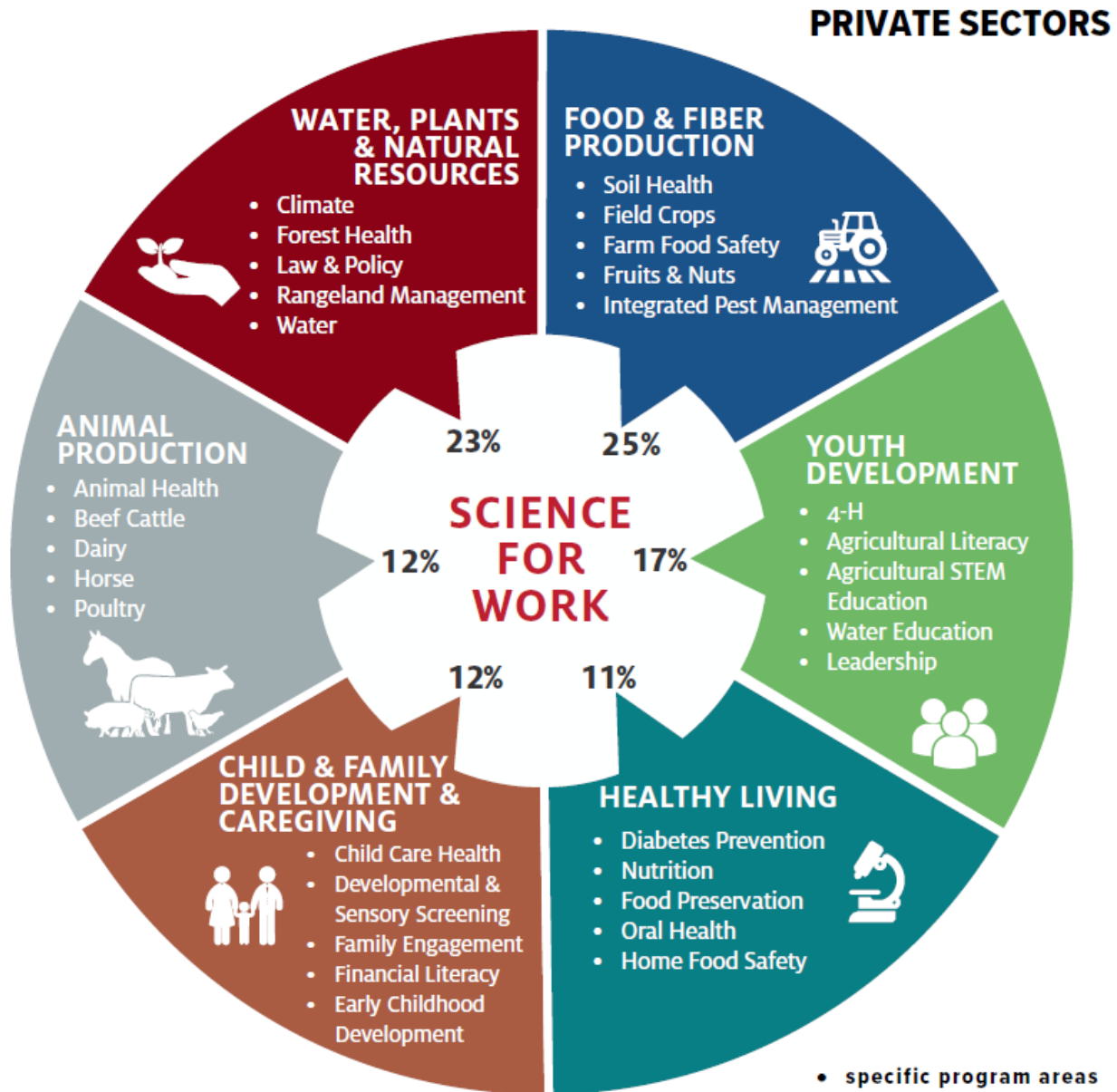
## UNDERGRADUATE DEGREES

CALS researches and extends science at work in six distinct, yet interconnected and interdependent, economic areas (upper case; specific areas in lowercase; percentages are current distribution of output proportions):



MTDC used to calculate research activity.

Cooperative Extension extends science for work in six distinct, yet interconnected and interdependent, economic areas (upper case; specific areas in lowercase; percentages are current distribution of output proportions):



**EXTENSION PROGRAMS**



We will allocate resources to meet needs and directions of the UArizona as a whole as well as based on being an exceptional and critical hub in the nation's knowledge network. This plan includes specific guiding principles for allocating resources.

This plan was developed starting from the points of delivery and involves all our employees. Every academic unit has a plan in the same format so these can be compared and contrasted. When presented from the administrative center outwards to the frontline where the rubber meets the road, each plan gets more granular and more specific. In this document, the overarching ALVSCE plan is presented first followed by those of each of our three mission areas, then each academic unit's plan follows. The division strategic intents are:

### Strategic Intents



Shane C. Burgess  
Vice President for the Division of Agriculture, Life and Veterinary Sciences, and Cooperative Extension  
Charles-Sander Dean College of Agriculture and Life Sciences



## Division Overview

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### **The special and historic nature of enterprises like ours**

Enterprises like ALVSCE were founded in agriculture but now embrace all life, environmental and many social sciences. They are present in each “**land-grant**” university. These enterprises operate differently from other entities on the UArizona campus. It is our heritage and the associated traditions that form the basis of the land-grant university culture.

More than one hundred fifty years ago, colleges like CALS were the first units established at the new land-grant universities founded by the Morrill Act of 1862. Enacted in the middle of a devastating Civil War, this act launched the then-revolutionary concept of public education. It was a direct response to the Industrial Revolution, changing social class structures and the need for a highly educated population so the United States could become a player in the world economy. For the first time, anyone could attain a tertiary education regardless of family wealth and/or political connections or other privilege. Today this aspect of our division mission is managed and led by **CALS Career & Academic Services** and our extremely diverse academic degrees are offered by academic units called “schools” or “departments” (see figure on page 7).

Following closely in time, the Hatch Act of 1887 was a direct response to America’s need to be a technologically advanced economy based substantially on a publicly funded and interconnected national network of research resources—this is our **Experiment Station**. Today, as in the past, the Arizona Experiment Station (AES) provides campus-based and state resources dedicated for use in research for technology innovations for US economic security. As part of the AES, there are also nine Experiment Station Units throughout Arizona.

Lastly, the Smith-Lever Act of 1914 established the **Cooperative Extension System** (CES), this was a direct response to the need for a focused direct approach to get the new knowledge created in the land-grant universities directly to the newly educated populace and so into the marketplace. The term “cooperative” means there is a three-way partnership between the University of Arizona (through ALVSCE), the counties, and the US Department of Agriculture. Each county has at least one CES office and some have several; six Indian reservations also have CES offices.

While each LGU is different, and regardless of internal administrative structures, the basic tripartite paradigm of enterprises like ours is shared with land-grant universities nationwide. This paradigm has proven a model for resilience and so successful that it has been imported by other countries as a preferred archetype of education, economic development and a component of national security. LGUs are many of the country’s elite universities.

**In short, our historic role is to create new people and new knowledge for a new economy.**

**This is as relevant today as it was in 1862.**

Today we are thought leaders creating tomorrow’s commercial leaders and tomorrow’s environment and are direct contributors to the rapidly changing economy.

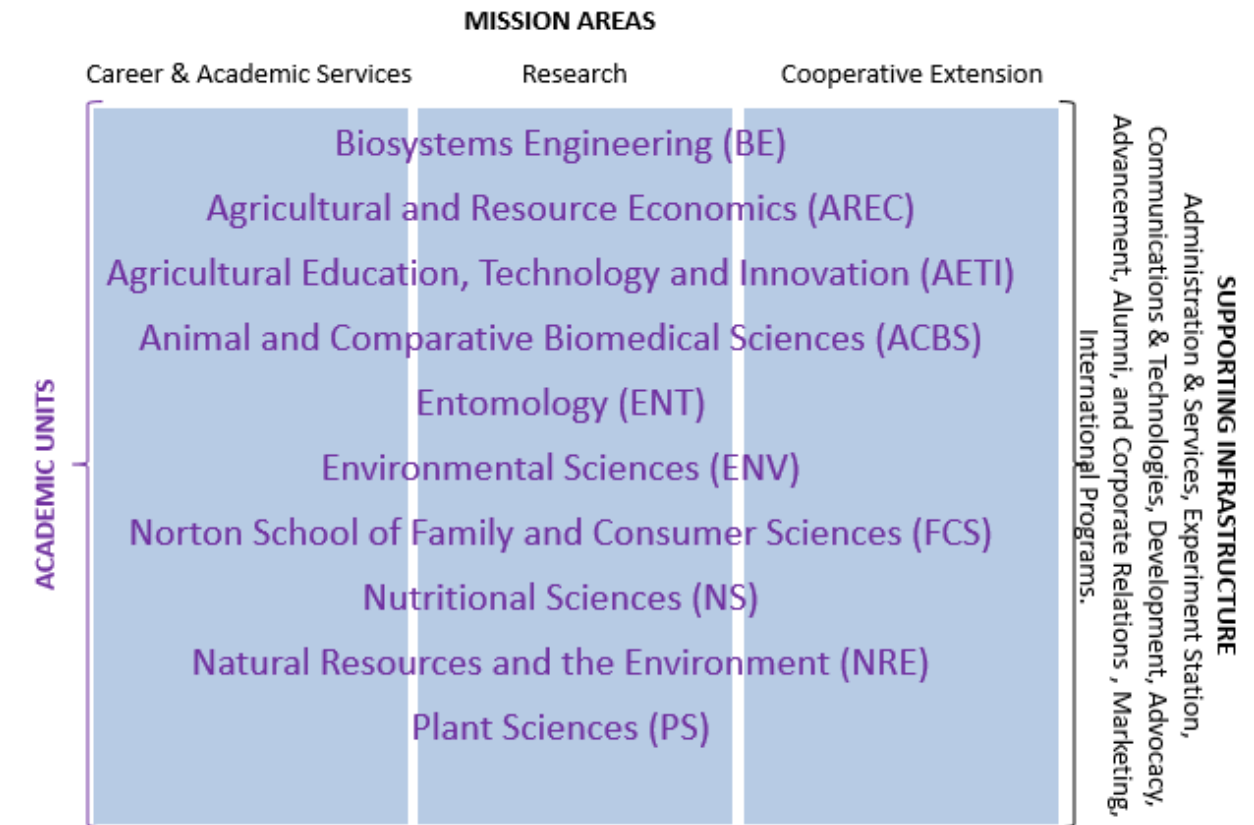


**Our unique relationship with the federal government**

Nationwide, enterprises like ours have a unique relationship with the federal government. A portion of our budget comes from the U.S. Department of Agriculture (USDA) after passing through the Arizona State Legislature as part of the division’s appropriated budget. This requires the CALS research efforts to submit an *Annual Report of Accomplishments and Results* to the USDA, as well as *individual reports* for each cooperating faculty member's research effort and *Impact Statements* on our program results. We are also charged to work directly with our sibling colleges and divisions nationwide in a cooperative and information sharing process—particularly with these in the western region. These efforts include sharing of printed and electronic information, as well as joint basic, applied and cooperative research projects. We have an obligation to attend professional meetings where information is shared and to submit research information in the form of publications to federal databases.

**ALVSCE Appointed Management and Leadership**

ALVSCE has a matrix structure of three mission areas of **teaching** and **research** (both led by an associate dean) and **Extension** (led by a director) coinciding with academic delivery units (each led by unit leaders) and counties (each led by county Extension directors). Business operations and infrastructure delivery are functionally organized.





# Strategic Plan

## *Division of Agriculture, Life and Veterinary Sciences, and Cooperative Extension*

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Responsibility and accountability for managing *inputs* and delivering on *objective metrics* for the two mission areas is vested in the associate deans. Authority, responsibility and accountability for managing *inputs* and delivering on *objective metrics* within the academic delivery areas (and thus the disciplines) is vested in the unit leaders. This means that most metrics used to measure, deliver and resource inputs are specifically identified by the three mission areas (Career & Academic Services; Research; Cooperative Extension) and academic-discipline delivery units. It also means that as the strategic plans get closer to the point of delivery in the units, they become more granular, more detailed and more specific.



## **PURPOSE, VISION, CORE VALUES AND MISSIONS**

**Purpose:** To ensure resilience and health of our communities, people, environments, and economies locally, regionally, and globally.

**Vision:** To be the most important driver in Arizona's economy, and the world's top enterprise in 21<sup>st</sup>-century agriculture, life sciences, and commerce.

### **Core Values**

*Trustworthiness* — we are honest and non-biased in our communications and committed to what we promise.

*Practicality* — we focus on education, research and outreach with near-term value and application as well as long-term solutions.

*Responsiveness* — we identify and respond to changing needs.

*Relevance* — we promote ideas and productivity that create positive impacts.

*Entrepreneurship* — we pursue initiatives that include calculated risk to deliver value.

*Ingenuity* — we reward innovation.

*Compassion* — we care about each individual's and community's circumstances, experiences and contributions.

*Respect* — we expect professionalism and collegiality.

*Pluralism* — we have formal delegated responsibility and authority and believe in faculty governance and collaboration.

*Egalitarianism* — we are committed to an accessible education and broad-based research rather than academic elitism.

*Diversity* — we embrace individual differences in thoughts, ideas, and actions, as well as personal experiences, histories, and perspectives.

*Inclusiveness* — we believe being inclusive is synonymous with being excellent and allows all our students, faculty, and staff to thrive.

### **Missions:**

To educate students and communities in ways that enable their future success in the regional and global economies.

To develop new knowledge and new technologies to benefit society.



## Environmental Scan

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### THE UARIZONA DIVISION OF AGRICULTURE, LIFE AND VETERINARY SCIENCES, AND COOPERATIVE EXTENSION FOR THE 4thIR

Like our nationwide peers we are located in our state's land-grant university. The College of Agriculture & Life Sciences (CALs) at the UArizona was the founding entity for the university, and the Division of Agriculture, Life and Veterinary Sciences, and Cooperative Extension (ALVSCE) continues to represent the founding mission and vision of the university.

ALVSCE is mandated to deliver on all three land-grant mission areas: teaching, research and Extension. Our strategic plan presented here focuses on what the division will be and what it needs to deliver in 2025. This process builds on the background provided by the *CALS 2010 Strategic Plan* (<https://alvsce.arizona.edu/about/cals-2010>). Much of what immediately follows in this overview has been drawn, or quoted directly, from that plan.

We recognize that the world we live in today is volatile, uncertain, complex, and ambiguous and we also recognize that we can survive it by being **flexible, agile, innovative, and responsive**. Doing only what we have been doing is not going to be effective.

Life will be more complicated not only for our faculty and staff, but for our students and our many constituents in the state and elsewhere. We cannot simply extrapolate trends – the future is highly uncertain and we need to understand and learn to function in such times. This means we will have to do things differently, but so will others with whom we work.

The rest next decade will be a period of continuing change and seems to have ushered in a new generation; we need to be prepared for both. There will be more significant changes and more uncertainties and perturbations and we will focus on plans that allow us to be most **resilient and responsive to our stakeholders and globally relevant in these areas**.

Our choices will be more difficult to make and to implement than any time in the memories of those working today. We can only plan for actions that are under our division's control but we have to be aware of options open to the state and university.

We will need to be more innovative, more entrepreneurial, more flexible and more nimble in addressing both the practical problems of society and the basic sciences. Being more entrepreneurial in particular means we need to accept **risk** as part of our management and leadership norms. We must continually review and be able to change direction quickly when we realize our risks are not paying off. We retain our two primary mission areas of teaching and research.

It is not possible to predict or even make a good guess at how our world will emerge from the *great recession*. We cannot simply extrapolate past experience; the Great Depression was ended by massive government spending induced by a world war. In 2010 CALs used a "Foresight to Insight to Action" approach developed by the *Institute for the Future* (<http://www.iftf.org/home/>) to describe how we should think about the future.

- The FORESIGHT studies suggested we are entering a world that is Volatile, Uncertain, Complex and Ambiguous.



# Strategic Plan

## *Division of Agriculture, Life and Veterinary Sciences, and Cooperative Extension*

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- The resulting INSIGHTS suggested a need for clear strategic directions as well as focused goals, but also to be Flexible, Agile, Innovative, and Responsive.
- Our ACTIONS, therefore, need to be different than those of the past and our strategic directions need to be within the context of a series of transitions within a changing world. **No one who is working today has solved the kinds of problems we are dealing with today.**

The great recession, beginning in 2007, signaled that a new normal would emerge from a period of crisis. We are just now, 12 years later, beginning to understand what this new normal is. But we do know very well that our audiences for this new normal include, as they always have, our students and Arizona's people, communities, industries, businesses, and organizations. In addition, we have national and international obligations for knowledge sharing and research involvement and to prepare future leaders and experts in their fields.

### **Resilience through integrated systems**

In 2010 one theme emerged after reviewing the challenges facing the world and the southwestern United States and then matching those challenges to our division breadth, expertise, experience, and history of interdisciplinary approaches—for both basic research and practical problem solving. That theme is **resilience through integrated systems** and it has five interconnected components:

- Arid and Semi-Arid Region Agriculture and Environment
- Individuals, Families, Communities, and Organizations
- Globally Oriented Basic and Applied Research
- Border Commerce
- The Bioeconomy

Resilience has multiple “sustainability” paradigms: defined broadly, and not just environmentally (i.e. climate, energy, water, plants, and animals); it also includes social and economic components such as commerce, global trade, food production, development, jobs, institutions, health, security, transportation, families, communities, communication, consumer perspectives, political interactions and infrastructure. Overall, ALVSCE takes a systems perspective, where a variety of things are interconnected and interdependent and this is widely applicable to many division programs.

Today ALVSCE is focused on **resilience**: our capacity to deal with events, whether predictable or not.

### **Divisions of Agriculture, Life and Veterinary Sciences, and Cooperative Extension in the 4thIR**

We need to be where the world is going, not where it is today.

Major periods of change have occurred in the past and over time our societies and commerce adapted (either rapidly or slowly, depending on the type of change) or died out. Today many significant things are happening concurrently – technology, demographics, economics, resources, physical and virtual infrastructures, life forms, genetics, memetics and general infrastructure are changing; the scale is larger;



the speed is faster and more globally interconnected; the degree and complexity of change requires greater effort on the part of many institutions (e.g., business, government, and education).

Enterprises like ours have changed dramatically over the years and a number added “Life Sciences” to their names, as we did in 2000. This isn’t just a marketing ploy. It is instead recognizing that enterprises like ours impact an enormous proportion of our commerce and we are central to the nation’s changing economy.

ALVSCE produces new people and new knowledge that support our growing economy through a very broad variety of industries – from ranching and greenhouse agriculture to biotechnology, consumer behavior, and social services. The following table demonstrates the dramatic and far-reaching economic impact that our academic, research, and outreach programs have on Arizona’s economy and the nation’s.

### **New Knowledge, New People, New Economy**

Everything that ALVSCE does can be summarized as either generating new knowledge or new people or participating in a new economy.

The 1950’s to early 2000’s saw ALVSCE-like colleges move from a production orientation to a science orientation. Today we need to integrate both technology and “basic sciences” into truly translational and impactful science that includes teaching, research and Cooperative Extension – much faster. Furthermore, we know that today’s graduates will have *multiple careers*, not just multiple jobs.

Some examples of the changes that enterprises like ours need to undergo include:

- Becoming more efficient, effective, innovative and entrepreneurial.
- Redesigning curricula and degree requirements especially removing parts of the curricula that are obsolete and/redundant.
- Getting more students valuable degrees faster.
- Offering many learning options and paths.
- Offering executive, professional and continuing education.
- Decreasing the number of employees and programs relative to the numbers of students but improving quality i.e. delivering on rising expectations with decreasing resources.
- Having a different mix of employees and a different mix of job titles.
- Being career focused and not degree focused.
- Being part of the cyber world and new areas of commerce.
- Focusing on being more of an economic asset to the state.
- Increasing collaboration with other units on campus, other universities worldwide and even non-academic entities.
- Ensuring that we are attractive to all parts of the demographic spectrum.



- Refocusing our Cooperative Extension efforts to be more in tune with 21<sup>st</sup> century state commerce needs.
- Making aspects of computer and computational sciences central to agricultural and other life sciences training.
- Becoming “wellness” colleges (as opposed to “sickness” colleges, like medicine).

### Key Driving Forces

There are key driving forces that help us identify where major changes will occur in the next 10 years are:

*Economic and Financial:* The economy is global. The 2007 recession didn’t change the world in itself but it accelerated changes we predicted in 2011. The worldwide middle class is increasing. We face a new reality of uncertain future economic conditions and reduced federal funding.

*Physical and Social Infrastructure:* The central Arizona region has been identified as the Sun Corridor “Megapolitan” Area, one of 20 such megapolitan designations in the US. The infrastructure is both aging and changing and includes buildings, cyber systems, transportation of goods and people, the production and transportation of energy and water, life-support systems, communications systems, and the governance mechanisms and roles of government that allow society to function. The rural-urban interface is a critical component to the state’s success. **We face the need to be responsive to technologies and changing state demographics.**

*Population, Demographics, Generations:* The first baby boomers turn 75 in 2021, several states are heading toward no “majority” cultural populations, and costs for medical care and retirements are unsustainable under current assumptions. Furthermore, those born after about 1980 are “digital natives” (i.e. who grew up with modern information technology) and as students learn and function differently than many faculty. Many others outside this age group also wish to take advantage of, and be enabled by, digital technologies. Consumers want different ways to purchase and to control their financial destiny. Furthermore, most of CALS incoming freshmen are at university to get a good job or to get to graduate school. **Diversity in age and demographics will impact our program delivery and our funding; we must fundamentally shift delivery models as well as disciplines.**

*Resources and Environment:* Needs for new energy sources as well as more efficient water and energy use will increase. Food, both internationally and in the US, will become a more valued commodity and more food production is predicted to be more vulnerable to climate changes, urbanization, and alternative land uses. The rate of food production gains seen in the past are predicted to slow in the near future. **For us this is a key area that we can positively influence and impact, especially in our region.**

*Science and Technology:* Bioscience is continuing to make changes and the implications of those changes on society and agriculture are continuing to unfold. Information technology is introducing “smart” everything (including sensor uses and robotics) and changes the way people work, learn, and interact socially. The web has moved from Web 1.0 (library, content) to Web 2.0 (collaboration, social networking) and is becoming “smarter” as it continues to evolve rapidly. These areas are also those where we as a division fundamentally connect with medicine. ALVSCE has an opportunity to be part of society’s shift from an illness paradigm to a wellness one. **For us this is a growth area.**



# Strategic Plan

## *Division of Agriculture, Life and Veterinary Sciences, and Cooperative Extension*

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### **Focus areas**

CALS has multiple academic focuses in the biological, natural and social sciences to respond to the challenges we all face. These focus areas are independent of specific administrative units and are carried out at units on main campus as well as in county Extension offices and on state-wide Experiment Station Units. Each administrative unit participates disproportionately in multiple focus areas. The relative effort in each area will vary over time depending on available opportunities and society's needs.

#### Environment, Energy and Natural Resources

Concerns the issues related to protection, enhancement and sustainable use of our basic environmental resources. These are soil, air, and water and the conservation, management and use of natural resources (wildlife, fisheries, rangelands, forests, watersheds, and flora and fauna ecosystems). Sustainable use of resources and the environment requires attention to public policy and an understanding of human factors as well as resource assessment, monitoring and management.

#### Plant, Insect, and Microbe Systems

Addresses the production and biology of plants used for food, fiber, livestock feed, industrial products, and for environmental and aesthetic purposes. Optimal and sustained productivity is based on understanding plants from the molecular to ecosystem levels and implementing best management practices, including integrated pest management for insects, weeds, and pathogens.

#### Health and Food Safety

Focuses on the relationships of the life sciences to human health promotion, disease prevention and food safety. Programs use interdisciplinary approaches to discovering, translating, and applying how nutrition and physical activity can prevent disease and promote good health and well-being. The safety and quality of food for human consumption includes transportation, processing and consumer handling. Overall, approaches range from basic cellular and molecular research to clinical human research studies and educational programs.

#### Families and Communities

Focuses on economic, social, psychological and biological factors affecting individuals, families, and groups over their lifespan. Topics include effective parenting, violence prevention, resource management, responsible decision-making, economic well-being of families and consumers in the marketplace, leadership skill building, and reduced exposure of children to toxins via integrated pest management in schools.

#### Animal Systems

Encompasses contemporary methods of biology to improve productivity and increase the quality, composition, safety, and desirability of animal products; promotes the use of integrated and long-term sustainable production systems that are compatible with arid environments; enhances genetic diversity and biological performance; and improves the health and well-being of food and companion animals.

#### Commerce



# Strategic Plan

## *Division of Agriculture, Life and Veterinary Sciences, and Cooperative Extension*

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Including consumers, marketplace, trade, and economics, this area deals with supply-chain management and retailing processes from the perspective of both the consumer and the business organization, global and national trade activities, and economic analyses of food and fiber as well as natural resources (including water, land, and the environment). It also contains the economic analysis and resource allocation processes of businesses, governments, and consumers and strategic analysis of the environments in which market participants operate.

### **Resource Allocation**

We must be extremely specific about how we allocate resources. This will be based on being exceptional, and thus impactful, at generating new knowledge, new people and contributing to the new economy. We will focus on where we are genuinely unique, valuable and outstanding and thus a critical hub for the nation's network of universities. We will also allocate resources consistent with the needs and directions of the UArizona as a whole. The following guiding principles will help in decision making when allocating resources:

1. Relevance to this ALVSCE, and thus UArizona, strategic plans.
2. Significance and impacts to Arizona and the world.
3. Potential for increasing our efficiency, effectiveness and innovation.
5. Existing strengths, weaknesses, capacity, and critical mass of unit or program and division.
6. Ability to leverage state investment to develop new funding from outside of the state-funding system.



# Strategic Plan

*Division of Agriculture, Life and  
Veterinary Sciences, and Cooperative  
Extension*

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## **ALVSCE Strategic Planning: At the coal face.**

In the late summer and early fall of 2019, all CALS units worked on a strategic planning. This process was an extension of the “**CALS 21**” process done in three phases. All units used the same format. Each unit head managed the process within the context of the discipline cultures. The first two phases were concerned with traditional environmental scanning, gap and SWOT analyses and asked tough questions. Together these provided specific and granular descriptions of the internal environment as it affects the units (and thus the college’s) opportunities and challenges. The questionnaires are included below and the answers to each are maintained in the units. Following this, each unit needed to complete the third phase which was to provide a very specific strategic plan in a standard format.



**Phase 1: Questions**

*Primarily for intra-unit use. December 2011 – January 31, 2012.*

1. How are we unique in the college, on campus, in the state, in the world?
2. What should we be known for?
3. What are we known for?
4. How are we positioned compared with others "like us" that gives us a competitive advantage and allows us to capture value?
5. How are we doing right now?
6. What are we doing that is:
  - a. Essential and positive:
  - b. Essential and neither positive or negative:
  - c. Essential but negative:
  - d. Not essential but positive:
  - e. Not essential and neither positive or negative:
  - f. Not essential and negative.
7. What deliverables must be maintained?
8. What deliverables must be enhanced?
9. What do we do that should be discontinued or modified?
10. What resources exist in our team, Unit, CALs, UA, the world at large that can help us?
11. What are we passionate about?
12. What are our positions versus our competitors that give us a (unfair) competitive advantage and delivers value?



**Phase II: Unit Strategic Planning Initial Report**

*Due to CALS Dean April 13, 2012.*

1. Where is the Unit today? (Identify and use objective benchmarks.)
2. Where do we want to be in the future so that we can differentiate ourselves from our competitors to give us a competitive advantage? (Includes specific values for the objective benchmarks selected in 1 and may include addition benchmarks)
3. What should we be focused on today to make it most likely that we will get where we want to go (rank order from most important to least; annotate as short term [1-2 years]; medium term [2-5 years]; long term [5-10 years])? Please use the following headings a-c and **provide a justification** for why each thing is placed where it is.
  - a. Existing areas to preserve, protect, or enhance.
  - b. Areas where totally new activities or structures are needed.
  - c. Areas to discontinue, de-emphasize, or modify.
4. Other ideas:
5. How do 3a-c align with/complement others CALS and UArizona units as well as other AZ higher education institutions?
6. Record of dissenting opinions:
7. Additional details (may not be strategic but are good ideas):
8. Appendices (only if needed).



### Phase III: CALS Unit Strategic Planning

Please carefully consider the implications for adopting each strategic goal and strategies and the following questions may be useful. Please note that answers to the following questions are NOT TO BE SUBMITTED AS PART OF THE DOCUMENT.

1. How do the goals and strategies proposed lead to unique niches for UArizona CALS?
2. What does this say about the need for faculty and academic professionals as well as staff and how would they be recruited?
3. How will this affect our ability to recruit and train highly qualified students?
4. How will this relate to our ability to generate funds?
5. How will this affect opportunities for alliances, collaborations and interdisciplinary programs?
6. What internal and/or external factors might positively or negatively affect our ability to attain these goals?

#### UNIT 2021 STRATEGIC PLAN <sup>(1)</sup>

*Unit's Purpose* <sup>(2)</sup>:

*Unit's 2021 Vision* <sup>(3)</sup>:

*Unit's Mission* <sup>(4)</sup>:

*Unit's Shared Values:*

- (1) Schools: please complete for each unit within the school as well as the school as a whole.
- (2) Definitive statement about the difference you are trying to make in the world. You may have one purpose statement that encompasses all areas your **overall, as well as teaching, research and service purposes** or up to 4 purpose statements to describe each separately. Likewise, units within schools may have one or up to four purpose statements.

Examples:

Disney: To use our imaginations to bring happiness to millions.

Johnson & Johnson: To alleviate pain and suffering.

Merck: To gain victory against disease and help mankind.

Southwest airlines: To give people the freedom to fly.

Wal-Mart: To save people money so that they can live better.

- (3) What will the outcome be once your unit's vision has been fulfilled?

- (4) What must be done to fulfill your unit's purpose?



Strategic Plan  
*Division of Agriculture, Life and  
Veterinary Sciences, and Cooperative  
Extension*

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**STRATEGIC GOAL ONE:**

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Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

**A. Current situation** (i.e. problem to overcome/opportunity to capitalize on) **and gap between current situation and desired situation:**

**B. Strategy/ies to achieve goal** (list if more than 1):

**C. Actions**

**Time Period (Fiscal Years)**

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**D. Inputs needed to achieve the goal** (do not limit to financial inputs):

**E. Objective Metrics that will be used to track progress towards attaining goal:**

**Notes :**





**Division Strategic Intents, Strategies and Actions**

FOUNDATIONAL STRATEGIC INTENT: **BE THE MOST SOUGHT-AFTER PLACE TO BE A PART OF.**

**Current situation and gap between current situation and desired situation:**

The most sought-after organizations to work in are also the most successful. This is especially important today with shrinking budgets and rising expectations. We have no data on how happy and engaged our people are now; but regardless, as a division we will benefit if we actively focus on this. The result will be better retention and better recruitment: 1. lower turnover lowers resistance to change and promotes innovation; and 2. people hire people for phenotype and fit, and we want our great people hiring people they believe have both. We must create an environment where all our people are our “top people” and where they truly enjoy working in ALVSCE, even though they may get paid more elsewhere.

**Strategies (Roman numeral) and actions (bullet point).**

- i. Attract and retain highest performers in all three mission areas
  - Identify clear standards throughout ALVSCE and have a culture that aspires to these.
  - Ensure that ALVSCE accounts for funded work whether it comes through sponsored programs administration or the UArizona Foundation.
  - Regardless of funder, respect and recognize extramural-funded work equally.
  - Be results focused, and measure outcomes and outputs rather than processes.
  - Identify and remove all non-productive bureaucratic or "busy" work from employees.
  - Measure quality as well as quantity.
  - Establish a culture of respect for all three mission areas and all job titles.
  - Zero tolerance for illegal, unethical or harassing behaviors.
  - Index promotion raises to Consumer Price Index (CPI).
  - Index all salaries to CPI.
  - Have the highest compensation:cost of living ratio in peer and aspirants groups.
  - Enable all employees to interact with senior leadership very close to their hire date.
  - High per capita investment in high performers: fewer, but more highly paid and resourced employees.
  - Reinvest what resources we have in the people we have.
  - Have systems in place to account for all benefits in start-up packages.
  - Make place, purpose, heritage and history part of our DNA.
  - Promote life balance.
  - Provide clear career paths in all three mission areas.
  - Work closely with resource areas to provide new investment in individuals.
  - Rebuild temporary commitment funds to enable the best hires and also provide continual support for existing faculty.
  - Professionalize ALVSCE service units and systems.
  - Provide cyber-infrastructure environment that is the best in the peer group and free, including local cloud and highest connectivity.
  - Automate grant forms such as COI, C&P, Data Management plan.

- Have a culture of "service with partnership" and, from staff in service units, an aspiration to create advocates.
  - Have culture of service leadership, enablement and the "inverted triangle" with ALVSCE administrators.
  - Be a national leader in Cooperative Extension system autonomy and accountability, yet most interconnected to CALS.
- ii. Move from the current "1-5 annual" review system that has led to inconsistency across ALVSCE units and grade inflation strings of decimals to system that recognizes accomplishment and is less arbitrary and dependent on individual line managers.
- Develop a review rubric based on recognizing: transformations; breakthroughs; recognized contributions; when progress is occurring, yet specific improvements are required; when significant specific improvement is required; and when individuals are not achieving expectations or being obstructive.
- iii. Use the matrix organizational structure in ALVSCE so that CALS unit heads are the recognized academic leaders, and CALS associate deans and the Cooperative Extension director are the mission directors, and both groups must work together.
- Establish separate meetings between dean and unit heads that are not transactional.
  - Dean will involve unit heads in strategic investment decisions
  - Executive Council is advisor to vice president who must take the delegated authority and responsible for the division and be accountable.
  - Vice president must delegate authority, accountability and responsibility to unit heads and mission leaders and not micromanage.
  - Improve communication in management by establishing cabinet.
  - Provide leadership and professional development opportunities.
  - Mission leader and unit head annual reviews to prioritize management and leadership knowledge, skills and talents.
- iv. Focus on internal and external engagement based on integrity and trust.
- Set up town halls/agenda-less meetings with division.
  - Have Faculty Council, Dean's Research Advisory Committee, Cyberinfrastructure Advisory Group, and Diversity and Inclusion Council.
  - Focus on trust, integrity, credibility, transparency and a sense of overall fairness especially in business affairs.
  - Embrace and respect our legal requirement for faculty and shared governance and also administrative autonomy based on delegated authority, accountability and responsibility.
  - Engage with Human Resources as much as possible to take maximum advantage of all that they offer.
  - Improve marketing and communication.
  - Raise the profile and respect of the office of Development and Alumni Affairs by including the Head DO in cabinet.



# Strategic Plan

*Division of Agriculture, Life and  
Veterinary Sciences, and Cooperative  
Extension*

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- Prioritize communication and transparency in business operations.
- Vice president spends 25% of time on development and external engagement activities.
- Externally focused vice president and internally focused mission directors.



**ALVSCE STRATEGIC INTENT ONE: BE A LEADING ECONOMIC DEVELOPMENT ENGINE FOR ARIZONA.**

**Current situation and gap between current situation and desired situation:**

We believe that we are an economic development engine for the state but do not measure and articulate our economic development impact well and can do better.

**Strategies (Roman numeral) and actions (bullet point).**

- i. Focus on regionally responsive and globally relevant education, research, development, technology transfer, and Extension.
  - Focus on developing research and Extension projects for resilient societies in arid and semi-arid regions.
  - Focus on diversified and non-commoditized industry as well as large scale commodities.
  - Become a partner with local governments and an element in their economic development vision and plans.
  - Develop short professional development, executive education, and continuing e-education courses.
  - Develop strategic alliances with industries.
  - Market to Arizona public and State Legislature the concept of CALS research and education as economic growth assets.
  
- ii. Improve research productivity as defined in the UArizona strategic plan.
  - Streamline grant/administration routing processes – fewer steps and signatures.
  - Computerize forms for all grant submissions.
  - Sponsored projects support staff to move into the office of the associate dean for research.
  - Salaries of sponsored projects support staff to be connected to IDC.
  - Sponsored projects support staff paradigm to go from policing to serving customers to creating advocates.
  - Measure true economic impacts annually in terms of jobs, dollars and social impact.
  - Establish a Research Advisory Council to identify specific mechanisms to double research.
  - Improve intra- and extra-CALS collaborations.
  - Exceptional communication especially with other colleges and divisions, vice presidents and the community.
  - Become a central partner in all intramural life science, medical and human biology initiatives.
  
- iii. Make informatics and data science application ubiquitous.
  - Maintain Cyberinfrastructure Advisory Group.
  - Maintain and grow the Communications and Cyber Technologies team.
  - Maintain and grow the Data Solutions Team to facilitate data-informed decision making and for predictive analytics.



# Strategic Plan

*Division of Agriculture, Life and  
Veterinary Sciences, and Cooperative  
Extension*

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- Maintain effective and efficient cyber-infrastructures that are directly used to enhance T, R, E missions.
- Educate faculty in using new resources and methods.



**ALVSCE STRATEGIC INTENT TWO: PRODUCE EMPLOYABLE GRADUATES, WHO CAN DO JOBS THAT DO NOT YET EXIST AND CREATE NEW JOBS.**

**Current situation and gap between current situation and desired situation:**

The current perception with our external stakeholders is that we are focused on degrees and not careers for the future.

**Strategies (Roman numeral) and actions (bullet point).**

- i. Value, and develop methods of recognizing, exceptional education.
  - Establish transparent equitable mechanisms for unit heads to make teaching assignments.
  - Reward teaching and provide a professional development path in teaching.
  - Fulfill UArizona strategic plan expectations for retention and graduation rates.
  - Track employability and return on investment for all CALS degrees.
  - Decrease student costs by delivering online coursework within degree.
  - Use “e” or “distance delivery” as a canonical tool and not an end in itself.
  - Maintain exceptional professional advisors.
  
- ii. Have competency-based certification in skills that employers say they want in addition to technical skills that we teach.
  - Identify what the skills employers say are missing.
  - Identify ways to fit teaching skills into curriculum, especially using e-learning.
  - Develop examination mechanism and certification.
  
- iii. Focus on launching careers in applied professional areas.
  - Establish a general course/s that introduce all CALS students to economics, business principles, the bio-economy, and global commerce--competency based.
  - Define specific opportunities for CALS Ambassadors and define their role in CALS.
  - Establish a “visiting leader” lecture series.
  - Establish a Mentor In Residence in Entrepreneurship and Innovation.
  - Track graduates’ careers as a measure of educational value.
  - Give every CALS student some education in the critical foundations of commerce, especially those taught in CALS already (such as principles of economics, sales and marketing using CALS resources).
  - Partner with other UArizona colleges to cross-train students in intercultural skills, political sciences, entrepreneurship, computing and business.
  
- iv. Become a national leader in graduate job placement.
  - Restructure Career and Academic Services to have people focused on “Careers, Commerce and Industry” as well as “Distance & Global Initiatives.”
  - Be career- and not degree-centric.
  - Increase internships.



# Strategic Plan

*Division of Agriculture, Life and  
Veterinary Sciences, and Cooperative  
Extension*

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- Engage annually with employers to identify what should be in a curriculum that is relevant to the 21st century.
- v. Grow professional education.
- Work closely with Arizona's community colleges to deliver distance education and degrees at a distance.

ALVSCE STRATEGIC INTENT THREE:

**BE THE MOST EFFECTIVE, EFFICIENT, RESPONSIVE, FLEXIBLE, AND FINANCIALLY SUSTAINABLE ENTERPRISE ON CAMPUS.**

**Current situation and gap between current situation and desired situation:**

Continually reassess and improve on how we work with people (internally and externally), our cost structures, finance and business systems and practices, and how we utilize technology.

**Strategies (Roman numeral) and actions (bullet point).**

- i. Maintain sound, efficient, effective and financially responsible division management.
  - All implementation decisions will be made by those closest to the problem.
  - Use Activity-based, or Zero-based budgeting throughout the division.
  - Maintain the minimum administration and bureaucracy.
  - Have similar administrative support structures in each unit.
  - Ensure that all peripheral unit business offices deliver the same level of service at the best level of competence in the university.
  - Standardize unit annual review format to be primarily objective.
  - Minimize bureaucracy, busy work and maintain appropriate infrastructure.
  - All service staff will focus on success and accountability rather than regulation and policing.
  - Maintain appropriate business function infrastructure to efficiently complete work in compliant way.
  - Minimize investment in depreciating assets and maximize investment in people.
  - Measure what we need to manage and only that.
  - Every unit will have a "living" strategic plan in the same format that has clear goals, strategies, actions, responsibilities, inputs and metrics.
  - Maintain 5-year predictive budget model for ALVSCE.
  - Maintain 3-year predictive budget model for academic units.
  - Begin capital projects only once funding is in place.
  - All units with debt to ALVSCE will have a debt management plan and pay debts back.
  
- ii. Decisions and accountability are to be as close to the point of delivery as possible.
  - Administrative heads will be selected and assessed on their leadership and management performance and motivation.
  - Focus scarce Development resources into units that have philanthropic potential.
  - Development is a standard part of all academic unit leaders' jobs.
  - Delivering on the division's contribution to the UArizona strategic plan is the division's responsibility.
  
- iii. Work only in strategically critical and/or exceptional areas that are regionally important and globally relevant, delivering on the UArizona strategic plan and where we either are national leaders or could be.





# Strategic Plan

*Division of Agriculture, Life and  
Veterinary Sciences, and Cooperative  
Extension*

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- Build strategic partnerships and alliances with other public entities as well as private industry rather than transactional relationships.

# Career and Academic Services

## **CALS CAREER AND ACADEMIC SERVICES 2019-2025 STRATEGIC PLAN**

(Revised 11/6/2019)

*Career and Academic Services' Purpose (1):* We strive to effectively promote, facilitate and support excellence in instruction and all aspects of the CALS student experience toward the goal of graduation and launch of a successful career for every student.

*Career and Academic Services' 2025 Vision (2):* Our graduates are nationally competitive for career paths in their chosen fields.

*Career and Academic Services' Shared Values:*

- Sense of Community
- Diverse cultures
- Collaboration
- Accountable Responsible Behavior
- Delivering on our commitments
- Integrity
- Forward thinking
- Quality and excellence
- Innovation and Entrepreneurship
- Positive attitude in thinking
- Lifelong Learning

## **STRATEGIC GOAL ONE: OFFER APPLIED DEGREES THAT PUT SCIENCE TO WORK**

### **A. Current situation and gap between current situation and desired situation**

Central to the CALS instructional mission is our offering of degrees and academic programs that prepare students to do jobs that do not yet exist and create new jobs, at the same time fueling economic development for the state of Arizona. CALS offers 18 applied Bachelor of Science degrees and 40+ graduate degrees and certificates across 10 academic departments and schools. The applied nature of our degrees raises the employability of our students as they seek jobs after graduation. But, within each academic discipline, rapid technological advances and continual changes in global market forces continue to challenge our ability to prepare students to be nationally competitive for jobs in their chosen fields. Employer feedback reminds us that many graduates nationwide lack fundamental career skills that would allow them to more effectively leverage their technical expertise into workplace productivity. We must continually seek and respond to market feedback and changing industry conditions in order to be innovative and nimble in evolving new curriculum.

### **B. Strategies to achieve goal.**

- i. Establish multiple channels for seeking regular feedback from industry representatives as to the changing needs of the marketplace and the qualifications of our students, both undergraduates and graduate students (e.g., industry advisory boards for each of our major degree programs; Career Center advisory board; regular networking opportunities for faculty and industry representatives)
- ii. Facilitate the translation of market feedback into departmental action plans that regularly refresh existing curriculum and develop new programs (degrees, subplans, minors) in response to the changing needs of our employers and communities
- iii. Encourage units to develop new programs (possibly through multi-unit collaboration on certificates or minors) that target non-majors in order to deliver knowledge and skills in small bites to facilitate credential stacking tailored to each student's career aspirations.
- iv. Bring industry and the community virtually into the classroom to enhance student learning
- v. Provide stronger "hands-on" learning where students participate in "real-world" or virtual practical experiences (e.g., internships; out-of-class experiential learning)
- vi. Create an engaging student environment within CALS that establishes an expectation of student participation in clubs, leadership and experiential learning activities as the norm
- vii. Develop and implement a set of CALS Career Skill Competencies to bake into existing CALS curriculum and guide the development of new courses, across all majors
- viii. Facilitate the launch of CALS faculty learning communities to raise faculty awareness of career skill competencies and develop techniques for building those skills in students
- ix. Help departments identify new career-oriented B.S. programs that could be offered as joint efforts or in concert with the Community Colleges and the new College of Applied Sciences

## **STRATEGIC GOAL TWO: EXPAND UNDERGRADUATE DEGREE ENROLLMENT FOR STUDENTS BEYOND THE TUCSON CAMPUS**

### **A. Current situation and gap between current situation and desired situation**

CALS currently offers 18 undergraduate degrees that enroll about 3,000 majors, the vast majority of whom are located on the Tucson campus. However, we have comparatively small instructional outreach beyond the main campus, relative to other colleges on campus and given the available instructional technology at the UA. To deliver on our land-grant mission, CALS academic units must become increasingly entrepreneurial in distance, online and global arenas to broaden our instructional reach. Over the next five years CALS will seek to significantly expand the availability of our degree and certificate programs to place-bound students across Arizona and the southwest region as well as to national and global audiences.

### **B. Strategies to achieve goal**

- i. Encourage entrepreneurial program development throughout CALS by communicating to academic unit heads, faculty and advisors the opportunities and challenges (e.g., required resources, budgetary implications, potential enrollments) associated with expanded delivery of CALS instructional programs outside of Tucson.
- ii. Assist departments in developing relationships with UA Global, Arizona Online and UA Distance campus leaders and staff
- iii. Serve as CALS liaison with partner campuses in the UA Global micro-campus portfolio and the Arizona community college network to explore demand for CALS degrees and facilitate the launch of partner programs
- iv. Provide leadership to develop and improve distance, online and global curriculum delivery models that fit both CALS degree programs and niche student needs, including faculty training to effectively utilize these models

## **STRATEGIC GOAL THREE: EXPAND COMMUNITY COLLEGE TRANSFER OPPORTUNITIES AND INCREASE DEGREES AWARDED TO TRANSFER STUDENTS**

### **A. Current situation and gap between current situation and desired situation**

CALS has excellent relationships with many Arizona Community Colleges, especially in Yuma at Arizona Western College and in Casa Grande at Central Arizona College. About 35% of our incoming new students (freshmen + transfers) each Fall are transfer students, the large majority from Arizona community colleges. We have established some 2 + 2 programs and several CALS degrees can be completed via distance delivery through online course offerings. However, the nature of CALS applied degrees should appeal to a large number of community college students in Arizona's population centers in the greater Phoenix and Tucson areas. Consequently, we perceive significant potential for increasing transfer enrollments to our main campus, as well as distance campus degree programs for community college (CC) students who are place bound, especially in the Phoenix area.

### **B. Strategies to achieve goal.**

- i. Increase collaboration with UA Distance and the College of Applied Sciences to identify pockets of demand for our applied degrees
- ii. Develop deeper relationships with community college staff and faculty to improve course alignments, identify post-degree career aspirations of CC students, and increase communication regarding CALS degree options (estimated time to degree; career opportunities, etc)
- iii. Increase number of CALS degrees, certificates and other programs offered through UA Distance campuses
- iv. Work with UA Office of Digital Learning (ODL) to improve the quality and smooth the delivery of existing and new distance offerings
- v. Facilitate the smooth and predictable transfer of units with minimal duplication of effort, at the same time allowing for the reverse transfer of credits
- vi. Identify and alleviate economic barriers to transfer

## **STRATEGIC GOAL FOUR: ENHANCE CALS RECRUITMENT**

### **A. Current situation and gap between current situation and desired situation**

In 2016, CALS initiated the development of a recruitment marketing team. Since then, the team has built a foundation for recruitment marketing and the incoming class numbers have moved from being flat year-over-year to a 14% increase in 2019. We need to continue to build on these recruitment efforts with emphasis on under-enrolled majors, and those in areas with room to grow to reach a target growth goal of 7% - 10% year over year until 2025.

### **B. Strategies to achieve goal**

- i. Through major-specific marketing initiatives targeted to students and parents, increase awareness of how CALS degree programs prepare students to do jobs that do not yet exist and prepare them for 4IR
- ii. Educate students about options to help them find the right major for them earlier in their college experience
- iii. Increase affinity for CALS degree programs through partnerships with youth development programs including 4-H, FFA, DECA (Distributive Education Clubs of America), FBLA (Future Business Leaders of America)
- iv. Increase likelihood that counselors will recommend CALS majors to students by reaching out to HS and college counsellors through various marketing and communications initiatives
- v. Work with CALS schools and departments to improve the prospective and current student experiences on their units' websites
- vi. Support graduate recruitment through digital marketing

## **STRATEGIC GOAL FIVE: INCREASE RETENTION, PERSISTENCE AND GRADUATION**

### **A. Current situation and gap between current situation and desired situation**

A successful retention, persistence, and graduation strategy is an integrated, collaborative plan that starts with recruitment and continues with faculty, academic advisors, career development, student support staff, peer mentors, and alumni engagement. To be effective, the strategy must consider the entire student experience – from prospective student to alumni, must articulate student success outcomes (including for academic advising), and must rely on accurate and actionable dynamic student data. Our retention rate of 85.6% for the Fall 2018 entry cohort is higher than the University as a whole, but our goal is to increase that to 91% by 2025. Our 4-year graduation rate, based on the Fall 2015 entry cohort, is 50.4%. Our 6-year graduation rate, based on the Fall 2013 entry cohort, is 65.6%. Again, these are slightly higher than the University as a whole, but our goal is to increase the 4-year rate to 61% and the 6-year rate to 75% by 2025. Our in-migration has traditionally been much higher than our out-migration. However, this is not reflected in the retention rate because migration is not tracked along with the freshman cohort and several programs in CALS are pre-programs without a specific freshman cohort. As a unit, intentional tracking and support of these cohorts not accounted for in the retention rate, will be in place. We will infuse our core culture of CALS as family in all we do.

### **B. Strategies to achieve goal.**

- i. Infuse our core culture of CALS as family in all we do.
- ii. Utilizing a data-informed strategy of "precision retention", increase retention and graduation rates among all student groups (specifically FTFT, Schedule for Success, transfer, first generation, underrepresented minority, distance/online, and active non-enrolled students)
- iii. Maximize programs and services, at all campuses, for specific populations – new students, first generation, and probationary students
- iv. Advance quality academic advising focused on a developmental, proactive strengths-based philosophy as defined by NACADA
- v. Leverage the peer mentor model to achieve 100% peer-to-peer connection for CALS students.
- vi. Increase awareness of club membership as first step in leadership and career development



## **STRATEGIC GOAL SIX: ENHANCE CAREER DEVELOPMENT**

### **A. Current situation and gap between current situation and desired situation**

Career and Academic Services has a strong working relationship with UA Career Services Center. However, due to the wide range of unique majors in our college, there needs to be a greater effort put forward in engaging our students in career exploration and experience. This includes working with departments to develop more structured programs for internships, leadership development and other programs that will make our students more competitive in the industry.

### **B. Strategies to achieve goal.**

- i. Raise student awareness of opportunities for post-graduate employment and career paths associated with CALS degrees
- ii. Work with industry to increase the number of available internships and other experiential learning opportunities.
- iii. Develop a committee of representatives from all CALS academic units to inform and guide career activities.
- iv. Utilize input and feedback from CALS Career Center Industry Advisory Board to update and effectively implement career competencies.
- v. Partner with Student Engagement and Career Development to integrate technology and student experiences.
- vi. Through workshops and signature networking events, encourage students to interact with employer while improving essential career (soft) skills.
- vii. Encourage students to gain advanced career, management, and business skills through activities of the Dean's Leadership 50 (DL50) program.

## **STRATEGIC GOAL SEVEN: INCREASE FINANCIAL SUPPORT FOR INSTRUCTIONAL EXCELLENCE**

### **A. Current situation and gap between current situation and desired situation**

With scholarship development being a key part of the Pillar 1 “Wildcat Journey” section of the UA Strategic Plan, scholarship fundraising continues to be an integral goal for CALS. To further the teaching mission of Career and Academic Services, fundraising to assist academic units is also a priority, including renovation of laboratory spaces.

### **B. Strategies to achieve goal.**

- i. Develop a "needs" assessment across Career and Academic Services functional areas
- ii. In partnership with CALS academic units, develop a needs assessment for remodeling and updating of instructional spaces including lab areas and equipment
- iii. Identify and engage possible appropriate donors, in collaboration with CALS Alumni and Development
- iv. Partner with CALS Alumni and Development to create an easier path to online giving
- v. Develop a plan for doubling CALS scholarship endowments that will 1) encourage small dollar gifts from new CALS graduates, 2) specific scholarship segments such as a CALS student "unexpected expense" fund, 3) endowed position for the Assistant Dean of Career and Academic Services, 4) restricted operational account to encourage donations to support student programming

## **STRATEGIC GOAL EIGHT: PROMOTE FACULTY TEACHING EXCELLENCE**

### **A. Current situation and gap between current situation and desired situation**

Currently the two primary college-level tools for promoting instructional excellence are the Cardon Academy for Teaching Excellence (CATE) and the annual faculty awards for outstanding teaching. Both are effective, but can be further leveraged. Faculty instructional excellence can be promoted by supporting instructional training during sabbatical leaves; improving documentation of instructional excellence in the Promotion and Tenure process; increased recognition of faculty with regards to teaching. There are three awards currently given for instruction: Bart Cardon Award for Sustained Excellence in Teaching, Early Teacher, and the David E. Cox Teaching Award. However, very few apply for these awards. In addition, the Bart Cardon Teaching Academy sponsors faculty enhancement workshops which are marginally attended. Our goal is to continue offering teaching workshops and increase the number of participating faculty. This will also aid these instructors in the Promotion and Tenure process. Additionally, we strive to increase the number of applications for the teaching awards so that recognition may be given to our faculty for their excellence in teaching.

### **B. Strategies to achieve goal**

- i. Expand the criteria for documenting excellent teaching in the P&T process and promote the adoption of these criteria across CALS academic units
- ii. Increase the visibility of the Cardon Academy (CATE) fellows with representation across all 10 CALS academic units and a program for regular engagement with faculty in those units, including mentorship for new faculty
- iii. CATE sponsorship and leadership of CALS faculty learning communities focused on key CALS teaching initiatives such as promoting data literacy and other career skill competencies for all students
- iv. Leverage CALS participation in campus wide Faculty Learning Communities (FLC's) to position CALS as a leader in active learning and assessment.
- v. Initiate a program for promoting nomination of faculty for college, university, regional and national instructional awards
- vi. Identify external donors to support professional development for faculty adapting to active learning techniques, cutting edge technology for distance delivery and related innovations in instructional delivery

**STRATEGIC GOAL NINE: GRADUATE STUDENT INSTRUCTION**

**A. Current situation and gap between current situation and desired situation**

*To be completed by November 30.*

**B. Strategies to achieve goal**

# Research

## CALS RESEARCH 2019-2025 STRATEGIC PLAN

**Overall CALS Research Mission:** To advance knowledge across the continuum of basic to applied research in the mission areas of the College, and to convey the products of our efforts to the citizens of Arizona, the US and the world.

We will accomplish our mission by increasing the size and improving the quality of our research workforce, by maximizing the ability of our research workforce to conduct research and our ability to measure its impact, and by effectively communicating the products of our research to the world.

### STRATEGIC GOAL ONE

#### **BUILD ON EXISTING STRENGTHS AND IDENTIFY STRATEGIC NEW INVESTMENT AREAS TO MAXIMIZE RESEARCH ACHIEVEMENT.**

##### **A. Current situation and gap between current situation and desired situation:**

Declining state support for higher education and reduced federal funding for research require that we focus our investments in areas in which we can be disproportionately competitive and successful. The metrics based research objective is to increase research expenditures 50% by 2023 from 2010 levels. This will be accomplished through our projected ability to differentially invest in faculty and research endeavors along the continuum from discovery to applied research. Future investments will leverage key areas of existing strength and support strategically important new research areas. To accomplish this, we need to (i) evaluate diverse characteristics to discriminate between programs as excellent/strong, functional/promising, or unlikely to yield a meaningful return on investment as determined by financial as well as other measures of success; (ii) develop strategies to move programs from the latter categories to the first, or re-evaluate investment in them; (iii) support existing programs with demonstrable return or promise for growth, and identify new emerging programs for additional investment; and (iv) leverage our unique statewide Experiment Station research facilities and ensure full integration of our Extension mission with CALS research activities.

##### **B. Strategies to achieve goal:**

- i. Develop hiring strategies that maximize building critical mass in areas of identified research strengths, and that also enable us to respond rapidly to strategically important emerging research areas.
- ii. Incentivize and encourage integrative and interdisciplinary projects that address grand challenge themes.
- iii. Prioritize funding that leverages existing and prospective large project opportunities.
- iv. Align CALS research investments with major University-level initiatives in areas such as information sciences, the environment and biomedicine.
- v. Incentivize research productivity & extramural grant success by recognizing achievement through promotion, program support, formalized merit processes and salary increases.
- vi. Promote CALS leadership in UA-wide and multi-institutional initiatives.
- vii. Prioritize invention disclosures, patent applications and company launches in faculty evaluation.
- viii. Enhance integration of CALS research and extension programs.

**C. Actions**

- Implement hiring strategies to promote the following: a) achieving critical mass in areas of research strength; b) responsiveness to emerging research needs; c) hiring at all rank levels; d) immediate and long term return on investment; e) research across the continuum from discovery-based to applied research.
- Coordinate with university-wide initiatives to build integrative research centers and programs.
- Institute reinvestment packages for highly productive scientists at the time of promotion to associate and full professor.
- Establish bridge-funding mechanisms to support successful grant-funded programs that have had adverse grant funding decisions, and pilot funding mechanisms to stimulate new and innovative research efforts with promise for significant programmatic growth.
- Encourage and incentivize the use of CALS unique research assets, including Experiment Station Facilities, to build programs that address mission-based grand challenges.
- Recognize research excellence through CALS awards, and ensure that CALS faculty are nominated for University-wide, regional, national, and international awards, and strategically important national committees and advisory boards.
- Educate faculty and staff about technology transfer opportunities and processes, to maximize submission of invention disclosures and patent applications, and launch of startup companies.

**D. Inputs Needed to Achieve Goal**

- Cooperation of Unit Heads to coordinate hiring objectives with overall CALS strategies and goals.
- Allocation of CALS internal resources to ensure dedicated support for research initiatives and to maximally support and incentivize CALS research programs.
- Coordination of CALS research investments and activities with research strategies of the University, the state of Arizona, and the Nation.
- Support of CALS faculty in priority research areas with potential for high return on investment.

**E. Objective metrics that will be used to track progress towards attaining goals**

- Upward trends in number of grants awarded, total research dollars, publications, CALS-led multi-investigator grants, and additional metrics that measure research impact.
- Upward trends in total impact and impact per faculty member.
- Trending increases in invention disclosures, patents and startup companies.
- Identifiable and measured contributions by CALS to improved economic and social conditions in Arizona.

STRATEGIC GOAL TWO

**OPTIMIZE CALS RESEARCH INFRASTRUCTURE TO SUPPORT THE CALS RESEARCH MISSION**

**A. Current situation and gap between current situation and desired situation:**

Cultural and structural changes over the past two years have improved CALS Research Office functions. Improvements include: i) reorganization and efficiency improvements in all facets of CALS pre award activities; ii) employing the most qualified people available to perform pre award services; iii) Implementing training programs for faculty and staff in grant preparation and submission processes; iv) Streamlining the Federal Capacity Funds grant program application and reporting mechanisms to reduce the overall burden to faculty and staff; v) Integration with University-wide processes to improve project pre and post award activities; vi) Streamlining and rationalization of CALS reporting systems, leading to improved efficiencies and data availability; viii) Cultural transformation in the CALS Research Office from a focus on monitoring and rules enforcement to a focus on service and enablement. This first phase of transformation has “reduced the friction” and optimized processes, thereby increasing the ability of faculty and staff to pursue their research objectives. Ongoing efforts are now focused in the following areas:

- 1) Research Infrastructure: The quality of the physical research infrastructure (laboratories and large equipment) is highly variable across college units and buildings. The physical infrastructure of all units must be updated to be on par with or exceed that of our peer colleges and institutions.
- 2) CALS Experiment Station Facilities: Strategic planning efforts have aligned our statewide research facilities to support the overall CALS research mission. This process must continue to determine how these unique research facilities can best directly support research of CALS faculty and staff, and/or provide significant value to stakeholders that is strategically significant to CALS and the UA.
- 3) Graduate Education: As the training environment for future scientists and also the source of our most important research workforce, CALS graduate programs must be uniformly strong and competitive with programs at the best US and international institutions.
- 4) Research Data and Metrics: Working with the office of the Associate Dean for Finance and Administration, significant improvements have been made over the past two years in data quality and availability. Continued improvements will enhance our ability to guide our policies through data driven analysis.

**B. Strategies to achieve goal**

- i. Develop a comprehensive plan for upgrading CALS research space and facilities.
- ii. Develop a strategy for renewed investment in and revitalization of CALS graduate programs.
- iii. Ensure optimal training for faculty and staff in all grants and contracts pre and post award related activities.
- iv. Develop strategies for utilizing CALS unique research facilities (Ag Centers etc.) and integrating with hiring decisions.
- v. Identify data and metrics that will maximally enhance real time analysis and research strategic planning.

**C. Actions**

- Evaluate all CALS research space and develop a multi-year plan for infrastructure upgrades.
- Engage relevant stakeholders to develop a comprehensive strategic plan for providing long term financial and operational stability to CALS graduate programs.
- Identify data needed to maximize research related activities and analysis, and assist in developing appropriate presentation mechanisms.



- Define the value of each Experiment Station Research Facility to the CALS Research and Extension mission, and encourage the integration of these facilities into unit research strategic plans.

#### **D. Inputs needed to achieve goal**

- Engagement of CALS graduate program leaders, unit heads and faculty concerning the future of CALS graduate programs.
- Engagement with UAIR and CALS Data Solution Team
- Engagement of unit heads, Experiment Station Facility Directors, and extension directors.

#### **E. Objective metrics that will be used to track progress towards attaining goals**

- Upgrading of substandard research space and facilities.
- Increase in the number and quality of graduate student; increase and rationalization of graduate stipend levels; reduction in average time to degree.
- Increased research activity associated with Experiment Station Facilities.

STRATEGIC GOAL THREE

**DEFINE AND MEASURE RESOURCE GENERATION FOR RESEARCH**

**A. Current situation and gap between current situation and desired situation:**

The metrics based research objective a 50% increase research expenditures by 2023 from 2010 levels. Although ABOR benchmarks track grants and contracts dollars, additional measures of scholarship productivity are relevant to measuring the total impact of CALS research. Relevant metrics include: number of Masters and PhD degrees; publications and impact factors, faculty and team awards, contribution to complex projects involving teams of scientists; invention disclosures, patents, and startup companies. A calculation of return on investment (ROI) is another important measure of our impact relative to investment. These objectives will be pursued in collaboration with the Associate Dean for Finance and Administration. Coming to consensus on metrics that best define success, collecting the metrics in an accurate and timely manner, and providing stakeholder access is an important component of our ability to strategically pursue research that maximally impacts the citizens of Arizona, the US and the world.

**B. Strategies to achieve goal**

- i. Use ABOR and UA metrics, plus additional CALS-defined metrics, to measure and track research productivity.
- ii. Identify measures of success and impact beyond funds received and expended, and incorporate these measures into individual, unit and college level evaluations.
- iii. Ensure that accurate data are available in real time through online resources, including UAccess dashboards.
- iv. Calculate, track and use for evaluation purposes return on investment (ROI) for individual faculty and units.
- v. Define, track and use for evaluation purposes measures of success for CALS Experiment Station research facilities.
- vi. Ensure robust training for faculty and staff in the collection and use of research metrics.

**C. Actions**

- In consultation with faculty, Unit Heads, and other stakeholders, identify a suite of metrics to measure, track and evaluate research performance.
- Work with UAIR, the CALS Data Solutions Team and the CALS for Finance and Administration to implement optimal online data reporting mechanisms.
- Review and optimize existing CALS training programs to provide CALS personnel with data needed for performance evaluations and research strategic planning.
- Work with Unit Heads, Experiment Station Directors, Associate Deans and other stakeholders to define metrics that measure productivity of the Experiment Station research facilities.
- Identify strategies to strengthen the connection between Research and Extension programs.

**D. Inputs needed to achieve goal**

- Broad input (faculty; HODs, CEDs; DRAC; Dean's Council) and agreement on priority metrics.
- Input on best metrics for ROI calculations in programs across CALS.
- Flexibility for incentives / rewards for individuals and teams / units that have high ROI.

**Objective metrics that will be used to track progress towards attaining goal**

- CALS units (including college level Associate Deans-Research, Extension, Instruction,



Administrative Services) will have clearly identified metrics and tracking for research productivity and resource generation.

- Data will be available to properly assess the contribution of CALS Experiment Station Research Facilities to the overall research mission.
- CALS faculty and staff will be familiar with and able to evaluate research metrics.
- Identifiable and measured contributions by CALS to improved economic and social conditions in Arizona.

STRATEGIC GOAL FOUR:

**EXPAND COMMUNICATION ON RESEARCH ACTIVITIES**

**A. Current situation and gap between current situation and desired situation:**

Communication of research activities and outcomes are a key part of the CALS research mission “...to convey the products of our efforts to the citizens of Arizona, the US and the world.” With increasing competitiveness for research resources and the attention of key stakeholders, communication about our research activities and findings is becoming increasingly important to our research mission. Presently the CALS Communications Office provides media coverage for all College endeavors, leaving insufficient resources for research communications. Particularly with the multitude of ways that science can now be communicated, additional resources are needed to expand communications related to ongoing and completed research. Improved internal communications are needed highlight research strengths among CALS faculty, while external communications are needed to promote our research activities to the public, other scientists, federal and private research entities, and potential donors. A focused effort is needed to highlight our achievements to the public, legislators, other government officials, and higher education stakeholders including ABOR.

**B. Strategy:**

- i. Increase our capacity to communicate ongoing research activities and research findings to stakeholders within CALS and the UA, and externally to a variety of stakeholders using all available platforms.
- ii. Use increased communications to raise the profile of CALS research locally, statewide, nationally, and internationally.
- iii. Develop a strategy to target industry sectors of relevance to CALS research activities.

**C. Actions**

- Develop and implement a comprehensive communications strategy for CALS research.
- Develop a comprehensive social media presence for CALS research.
- Invest the resources necessary to implement the communications strategy.
- Coordinate events that highlight CALS areas of excellence to stakeholders in Arizona. Identify and publicize projects that are supported by strategic investments from development sources and that leverage state investments.
- Integrate with communication activities at the UA to assist with information placement through UA venues.

**D. Inputs needed to achieve the goal**

- Resources to expand research communications capabilities.
- A comprehensive CALS research communications strategy.

**E. Objective metrics that will be used to track progress towards attaining goal**

- Increased number of media placements; increased social media activity related to CALS research.
- Increased awareness by all stakeholders of CALS research activities.

STRATEGIC GOAL FIVE:

**BUILD TECH TRANSFER, IP DEVELOPMENT, EXTERNAL BUSINESS RELATIONS/DEVELOPMENT**

**A. Current situation and gap between current situation and desired situation:**

Maximizing the transfer of knowledge and inventions to the private sector is a core University mission. The UA established Tech Launch Arizona (TLA) to strengthen its technology transfer and business development capabilities, and to enhance the impact of UA research, intellectual property (IP) and technology innovation. Similarly, CALS goals are to maximize the ability of faculty and staff to move their research knowledge and inventions to the private sector, and also to create and sustain industry partnerships. Effectiveness of these activities are measured using ABOR designated metrics: invention disclosures, US patents issued, IP revenue, and new companies started. Although CALS has begun to take advantage of the new capacity provided by TLA, including a TLA licensing manager focused on CALS, we do not yet have a strong culture of encouraging and rewarding disclosures, tech transfer and business development. Furthermore, effective mechanisms have not yet been defined for creating and sustaining industry partnerships.

**B. Strategies to achieve goal:**

- i. Embed technology transfer, business development training and informational workshops into existing CALS faculty and staff training programs.
- ii. Develop strategies and processes to enable and sustain industry partnerships.
- iii. Establish clear faculty performance criteria so that technology transfer activities and business relationships are rewarded in the promotion and tenure process.
- iv. Add entrepreneurship to faculty and staff position descriptions.

**C. Actions**

- Improve and update existing training modules and workshops for CALS faculty and staff.
- Provide mechanism(s) to support entrepreneurial initiatives proposed by CALS faculty.
- Review promotion and tenure criteria to ensure full consideration of entrepreneurial activities in faculty career progressions.
- Identify and nurture industry partnerships.

**D. Inputs needed to achieve the goal**

- Cooperation and time of contracting units to develop more efficient mechanisms for establishing and maintaining industry partnerships and support of UA research.
- Faculty time and interest to attend workshops.
- Improved and more transparent reporting of progress on ABOR approved metrics.

**E. Objective metrics that will be used to track progress towards attaining goal**

- Increased numbers of disclosures, patent applications, patents awarded and companies launched.
- Increased number of faculty reporting patent/IP/other entrepreneurial productivity.
- Increases in contracts and other relationships with industry partners.
- Workshop attendance and interest in IP/contracting activities by faculty and staff.

# Cooperative Extension



## **COOPERATIVE EXTENSION SYSTEM**

### **Purpose:**

To improve lives, communities and the economy

### **Vision:**

Cooperative Extension is a vital national leader in creating and applying knowledge to help people build thriving, sustainable lives, communities and economies.

### **Mission:**

To engage with people through applied research and education to improve lives, families, communities, environment, and economies in Arizona and beyond.

### **Shared Values:**

Accountability, collaboration, collegiality, diversity, exploration, fairness, innovation, integrity, knowledge-based, lifelong learning, problem-solving, proactive, productivity, responsiveness, sustainability, trust

STRATEGIC GOAL 1:

**IMPROVED ECONOMIC SUSTAINABILITY NATURAL RESOURCE MANAGEMENT AND UTILIZATION**

**A. Current situation**

Arizona's increasing population has an enormous impact on vast tracts of public and private land. During the period between 2000 and 2010, Arizona's population increased by just under 25% (US Census Bureau). Suburban development, traditional land uses and other activities all influence natural resources such as: surface and ground water quality and quantity, soil stability, vegetation and wildlife. This rapid urbanization permanently alters natural watershed characteristics. Informed land use decisions are the key to protecting the natural resources, community character, and long-term economic health of Arizona's communities. In addition, land ownership in Arizona is unique with 28% tribal, 42% federal, 13% state and 18% privately owned. The complex mix of land ownership can create challenges in managing natural resources on a landscape level. Changes in environmental conditions (drought conditions for the past 15+ years, wildfires of large size) further complicate decision making regarding natural resources and create an ever changing situation for land managers, producers, and homeowners.

**B. Strategies**

- i. Reassess current program areas for relevancy.
- ii. Prioritize programs that meet the changing needs of clientele and the environment. Discontinue programs that show little or no impact. Initiate new programs based on needs assessments.
- iii. Develop new/strengthen current partnerships with federal, state, county and municipal governments, NGOs, producers, landowners, private industry and citizens.
- iv. Strengthen programming ties between campus and county by using a statewide team approach for common issue based programs.
- v. Partner with other state extension systems with similar issues to provide regional programming where appropriate.
- vi. Develop electronic/technology tools to compliment programs where not already in place (websites, videos, etc.).
- vii. Develop statewide evaluation and impact measures for common programs (examples: forest health, rangeland monitoring, water conservation, small acreage landowners, and noxious weeds).

**C. Actions**

	<b>Time Period (Fiscal Year)</b>
Perform periodic assessments of needs and issues.	FY13
Identify current key partners and potential new partners and their roles or potential roles.	FY13
Approach possible new partners where it makes strategic sense for a program.	FY14
State support for statewide program teams.	FY13, 14
Explore partnership with other state extension programs.	FY14
Review current electronic/technology tools by program.	FY13
Develop electronic/technology tools to compliment programs.	FY14-15
State support for evaluation person to help with design and implementation of evaluation tools.	Ongoing



**D. Inputs needed to achieve the goal**

Faculty, staff, partners, volunteers, time, funding, equipment, technology

**E. Objective metrics that will be used to track progress towards attaining goal**

- Number of people attending programs
- Number of people who report increased subject matter knowledge
- Quantify number of acres impacted
- Results of field trials and monitoring efforts
- Test/quiz scores from on-line courses
- Quantify number of sites monitored
- Quantify number of collaborative planning efforts
- Impact gathered via surveys, evaluations and personal interviews
- Program evaluation tools utilized to measure outputs and impacts
- Program outputs and outcomes are documented and disseminated
- Economic impacts are documented and disseminated
- Funds received from grants and contracts



STRATEGIC GOAL 2:

**SAFER, MORE PROFITABLE AND SUSTAINABLE FOOD, PLANT AND ANIMAL SYSTEMS.**

**A. Current situation**

Currently we have diverse and segmented efforts to improve this situation across the state. In many cases lack of communication systems and cooperation have hindered efforts to make more meaningful impacts on the lives and communities of our clients statewide.

**B. Strategies**

- i. Develop an engaged and collaborative network of Extension Professionals
- ii. Increase marketing of CALS Cooperative Extension Programs
- iii. Identify baseline data through needs assessment/situation analyses
- iv. Seek funding through USDA and other organizations
- v. Develop partnerships with statewide organizations and local governments

**C. Actions**

**Time Period (Fiscal Years)**

Increase departmental buy in by creating win-win opportunities	FY2012-21
Hire a communications specialist for CALS	FY2012
Hire a grant writing specialist for CALS	FY2012
Hire an evaluation specialist for CALS	FY2012
Collect baseline data through systematic and consistent methods across the state	FY2012-13
Increase leadership development training	FY2012-21
Train County Extension Directors (CEDs) to work with local government and statewide organizations	FY2012-21

**D. Inputs needed to achieve the goal**

- Volunteers to leverage impact of our programs and our work with local governments
- Use of non T/C positions to run local programs
- Formed collaborations with internal and external stakeholders
- Funding

**E. Objective metrics that will be used to track progress towards attaining goal**

- Track economic progress against baseline data
- Improved agricultural productivity
- Improved agricultural income
- Rising standard of living for Arizona agricultural producers
- Reporting/evaluation systems

STRATEGIC GOAL 3:

**IMPROVED COMMUNITY ECONOMIC VITALITY.**

**A. Current situation**

Employers want competent employees (both youth and adults) who don't require additional monies to train and retain. Individuals also need to develop increased evidence of competitiveness to survive and remain nimble in the marketplace.

**B. Strategies**

- i. Engage citizens in community youth development
- ii. Promote critical thinking - decision making –
- iii. Promote teamwork - consensus building - technology skills
- iv. Teach citizens about sustainable resource management
- v. Work collaboratively with economic development councils to look at new or alternatives business ventures that could bring jobs to local communities
- vi. Provide leadership training to local thought leaders through Project CentRL and other training programs

**C. Actions**

- Form a team.
- Access existing resources including: FCHS Curriculum, Project CentRL, 4-H Projects, Mentor, Clientele Volunteer Programs: MG, 4-H leaders, KKONA, VISTA/ AmeriCorps/ Internships.
- Develop measures and outcomes evaluations.
- Plan and deliver statewide programs.

**D. Inputs needed to achieve the goal**

- Personnel
- Skills training and delivery applications that include technology.
- Credits, certificates and other employee/employer valued motivators.
- Time of faculty and staff
- Resources

**E. Objective metrics that will be used to track progress towards attaining goal**

- Program evaluation tools utilized to measure outputs and impacts
- Number of people attending programs
- Number of people with increased knowledge and skills
- Number of collaborative planning efforts
- Impacts gathered via surveys, evaluations and personal interviews
- Program outputs and outcomes are documented and disseminated
- Economic impacts are documented and disseminated
- Funds received from grants and contracts

STRATEGIC GOAL 4:

**GROWTH AND DEVELOPMENT OF ARIZONA CHILDREN AND YOUTH.**

**A. Current Situation**

The research is clear—all young people need the support of at least one caring adult in their lives to thrive and make the successful transition to adulthood as a contributing member of the community. Arizona's high-school graduation rate has risen more than 8 percentage points over 10 years, but it still trails the national average, according to a new report that examined national education trends. Arizona's graduation rate was 68.2 percent in 2007, the most recent year that data were available. The national rate was 68.8 percent. A decade earlier the gap was nearly 6 percentage points.

Arizona students remain the lowest performing in the country in science—an area that many education and business leaders regard as critical to boosting the state's economic health. "The Nation's Report Card" report showed that 8<sup>th</sup> graders improved only slightly from two years ago, and were higher than those in only 5 other states. Forty-four percent of Arizona students lacked basic knowledge of science. Science education has not been a priority in Arizona until recent years. Only in 2007 was science included in the AIMS test.

Although more than 30 percent of the state's Class of 2007 failed to graduate in four years, the state had the fourth-best improvement overall over the past decade, according to the report, "Diplomas Count 2010: Graduation by the Numbers - Putting Data to Work for Student Success."

According to the study, Arizona's graduation rate for Blacks, Hispanics and Asian-Americans was higher than the national average for the Class of 2007. Nearly 70 percent of Arizona Blacks graduated in four years, higher than in any other state. The national graduation rate for Blacks is less than 54 percent. More than 60 percent of Hispanics in Arizona graduated on time, compared with 55.5 percent nationally. More than 82 percent of Arizona Asian-Americans graduated in four years, while less than 81 percent of Asian-Americans graduated nationally. The graduation rate for White students in Arizona is slightly more than 74 percent, about 2 percentage points lower than the U.S. average. Slightly more than 48 percent of the state's Native Americans graduated in the same amount of time, while the graduation rate for Native Americans nationally was just above 50 percent.

Only 21% of those over the age of 25 have graduated from college. And college attendance is changing—only 16% of college students are 18-22 years of age. People are waiting longer to enter college or in some cases are returning to college to change careers, and then do so in order to gain specific workforce skills that will help improve their lives and the community in which they live.

**B. Strategies**

- i. First Things First (or early childhood education program) in every county
- ii. Out of school youth development and environment programs for all youth
- iii. Expanded health and nutrition education programs
- iv. Expand STEM education programs
- v. Mentoring programs to support academic achievement

**C. Action**

- Secure outside funding to support staffing—Present through 2021
- Increase 4-H enrollment—Present through 2021
- Expand afterschool programs—2015 to 2021
- Expand volunteer ranks and training—2013-2021

- Expand STEM programming—Present to 2021
- Offer college credit—2015 to 2021

**D. Inputs**

- staff, faculty, administrative support, volunteers, VISTA, AmeriCorps
- funding
- equipment
- educational programs/resources
- on-campus collaborations
- partners (schools, youth organizations, campus/county, community)

**E. Objective Metrics**

- kindergarten enrollment
- graduation rates
- test score trends
- dropout rates
- 4-H enrollment data
- truancy data
- number of juvenile justice cases
- STEM education programs offered
- after school programs and enrollment
- employment rate

STRATEGIC GOAL 5:

**IMPROVE THE PHYSICAL, MENTAL, EMOTIONAL, AND FINANCIAL HEALTH OF INDIVIDUALS AND FAMILIES.**

**A. Current Situation**

The relationships among food, food safety, nutrition, physical activity, finances, and child, youth and family development and caregiving are key components of good health. Creating and applying solution centered research and education to urgent and growing challenges to human development and health can help guide people and communities in Arizona to better health.

More than one in four Americans have multiple chronic health conditions including, obesity, diabetes, heart disease, and hypertension. In addition to comprising physical health, chronic conditions also include problems such as substance use and addiction disorders, mental illnesses, cognitive impairment disorders and developmental disabilities.<sup>1</sup>

The resource implications for addressing multiple chronic health conditions are immense: 66% of total health care spending is directed toward care for the approximately 27% of Americans with multiple chronic health conditions. Increased spending on chronic diseases among Medicare beneficiaries is a key factor driving the overall growth in spending in the traditional Medicare program. Individuals with chronic medical conditions have substantial challenges related to the higher costs of their healthcare.<sup>1</sup>

Child development is a foundation for community development and economic development, as capable children become the foundation of a prosperous and sustainable society. Creating the right conditions for early childhood development is likely to be more effective and less costly than addressing problems at a later age.<sup>2</sup> A child's most important developmental years are those leading up to kindergarten. Early childhood education is critical for helping Arizona kids five and younger receive the quality education, healthcare and family support they need to arrive at school healthy and ready to succeed.<sup>3</sup>

Other than the first year of life, there is no other developmental period during which individuals grow more than during the period of adolescence. The adolescent years are the time to form positive habits that will improve adolescents' long-term health and wellbeing. Family factors, like siblings being active and support from parents, can help adolescents get and stay active and healthy.<sup>4</sup>

<sup>1</sup> U.S. Department of Health and Human Services. *Multiple Chronic Conditions—A Strategic Framework: Optimum Health and Quality of Life for Individuals with Multiple Chronic Conditions*. Washington, DC. December 2010.

<sup>2</sup> The Arizona Early Childhood Development & Health Board (First Things First) <http://www.azftf.gov>

<sup>3</sup> The Science of Early Childhood Development National Scientific Council Center on the Developing Child at Harvard University, [www.developingchild.net](http://www.developingchild.net)

<sup>4</sup> U.S. Department of Health and Human Services. Adolescent Health. <http://www.hhs.gov/ash/oah/adolescent-health-topics/physical-health-and-nutrition/healthy-behavior.html>

**B. Strategies**

- i. Integrated healthy living programs (nutrition/food, gardens, food safety and physical activity) with children, youth and adults in every county (Examples – SNAP-Ed, EFNEP, Safe Routes to School, Walk

Across Arizona, Bone Builders, STEM, Connecting Youth with the Outdoors, and Small Steps to Health and Wealth)

- ii. Integrated programs in early child development and 4-H youth development, kinship/family development & family care, and financial literacy in every county (Examples – Brain Builders & Brain Waves, Oral Health - First Smiles, Family Resource Centers, STEM, Connecting Youth with the Outdoors, Leadership, Healthy Living, Kinship Care/Grandparents Raising Grandchildren, Small Steps to Health and Wealth)
- iii. Development and use of innovative curriculums and technology to support programs.
- iv. Program evaluation systems
- v. Program internal & external public relations/communications focused on program impacts

### **C. Actions**

1. Hire, retain and support professional development of faculty, staff, administrative Leadership Teams to develop, deliver and administer programs (Funding/resource support, implementation infrastructure, public relations and evaluation) 2012 - 2021
2. Increase number of trained volunteers and students to assist Leadership Teams 2012 - 2021
3. Obtain funding (federal, state, county and sponsored grant/contract funds) to support faculty, staff, students, volunteers and operations. 2012 - 2021

### **D. Inputs needed to achieve the goal**

1. Administrative support, faculty, staff, students and volunteers
2. Resources – federal, state and county funds, grants/contracts, cost recovery and gifts
3. Collaborations/partnerships – Federal/State/County Agencies (Health, Education, Economic Security), schools, community organizations, businesses, professional organizations

### **E. Objective metrics that will be used to track progress towards attaining goal**

1. Number of counties/regions with food-nutrition & physical activity, early childhood education, 4-H youth development, Kinship Care and financial competency programs.
2. Program outputs (e.g. number of program activities, participants, clients, agency and decision maker partnerships) and program impacts (short, moderate, long term) ( e.g. knowledge, skills, and selected behaviors related to health e.g. kindergarten readiness, high school graduation rates, academic performance, body weight/BMI, critical thinking skills, STEM assessments)
3. Curriculums/publications and technology developed and distribution outputs (e.g. number of products, number of people reached with products, funding generated from cost-recovery sales of products or sponsorship support of products) and impacts (awareness, knowledge, skills, behaviors and societal-economic condition changes)
4. Funding levels for support of programs from grants, contracts and gifts

STRATEGIC GOAL 6:

**BE THE KEY LINK BETWEEN THE UA AND ARIZONANS.**

**A. Current Situation**

CALS Cooperative Extension is not clearly understood even across the various units within CALS. Cooperative Extension is commonly misinterpreted and many opportunities are lost for effective programming. This situation is further exacerbated across the UA campus and into the general public. Too many people working in Cooperative Extension assume that their colleagues in CALS and the UA, as well as stakeholders across the state, have a clear and accurate understanding of the Extension mission and function. These assumptions are often erroneous.

**B. Strategies to Achieve Goals**

- i. Every Extension faculty and staff member to have a clear and concise understanding of what constitutes an Extension program and the purpose and objectives in directing Cooperative Extension programs in CALS.
- ii. The “Extension message” consistently communicated by all Extension administrators, faculty, and staff.
- iii. Extension assertively communicated at every level.
- iv. Active advertising to communicate the mission and capacities of CALS Cooperative Extension.

**C. Action**

- The Extension Director and the EAT group need to communicate and reinforce a consistent message to all facets of the CALS organization, the UA campus, and across the state and region.
- Each Extension faculty member should carry a consistent message forward to all sectors encountered relative to the CALS Extension mission and purpose.
- Every opportunity needs to be seized and utilized for communicating the Extension message.
- Expand volunteer ranks and training that will include a clear understanding of the Extension mission and function.
- An active advertising campaign needs to be developed and implemented to communicate the mission and capacities of CALS Cooperative Extension.
- A course in “Extension education” needs to be developed and taught within CALS.

**D. Inputs**

- staff, faculty, administrative support, volunteers, VISTA, AmeriCorps, graduate assistants, work-student students
- funding needs to be directed towards effective advertising and marketing
- securing opportunities in CALS, the UA campus, and in the general public of Arizona to communicate the Extension message. This represents a significant investment of time and energy on the part of all Extension administrators and faculty.

**E. Objective Metrics**

- better coordination and alignment of Extension programs throughout CALS
- levels of engagement with CALS Cooperative Extension from internal and external constituents
- improved public awareness from survey results and comparisons for 2012 and 2021
- funding allocations to Extension
- county level support for Extension





- internal (CALs and UA) support for Extension
- greater interest among students regarding careers in Extension

STRATEGIC GOAL 7:

**CALS COOPERATIVE EXTENSION WELL-INTEGRATED THROUGHOUT THE COLLEGE.**

**A. Current Situation**

CALS Cooperative Extension is currently operating on a pattern of individual program orientation, development, and implementation. As a result, some Extension programs are not coordinated with departments, counties, centers and stakeholders. Not only does Extension provide a “face” to the public in a multi-faceted manner that can be counter-productive but it also results in a very inefficient mode of operation considering the college investment in the overall Extension enterprise.

**B. Strategies to Achieve Goals**

- i. Every Extension faculty and staff member needs to have a clear and concise understanding of what constitutes an Extension program and these programs need to be coordinated and openly communication across all Extension programs in CALS.
- ii. There needs to be a clear set of relationships between an Extension faculty member’s position description, the program being carried forward, and a full understanding of the other complimentary programs that are being directed across CALS.
- iii. Extension needs to be more consistent and directed in the development and implementation of programs.
- iv. Mechanisms for communication and cooperation need to be more fully implemented and managed across CALS.

**C. Action**

- The Extension Director and the EAT group need to communicate and reinforce a consistent message to all facets of the CALS organization, the UA campus, and across the state and region in terms of the programs we are prepared to deliver and the expectation that programs will be coordinated from among the department, county, and center points of operation.
- Each Extension faculty member should carry a consistent message forward to all sectors encountered relative to the CALS Cooperative Extension mission and purpose and the relevance of their programs in the total context of delivery across the state and region.
- Position descriptions need to be evaluated in relation to faculty “Annual Performance Reports.” There needs to be a clear description of what constitutes an Extension program and the methods of integration that are being put into place.
- The EAT group needs to be active in directing well-coordinated Extension programs across the full spectrum of operation. This needs to be managed with department heads, Extension faculty in departments, County Extension directors, Extension faculty in the counties, and Extension faculty operating from the centers.

**D. Inputs**

- Extension administration, unit heads, and faculty need to implement regular review and strategic management mechanisms.
- Extension faculty need to be held accountable for the most effective modes of Extension program development and coordination at all levels.
- Extension programs need to fully utilize the capacity to develop and utilize the linkages with stakeholders involved in our many faceted programs to provide an active and productive conduit for

communication back to the college for the best direction in management and identification of strategic objectives.

**E. Objective Metrics**

- better coordination and integration among Extension programs throughout CALS
- levels of engagement with CALS Cooperative Extension from internal and external constituents needs to facilitate functional and effective “two way” lines of communication
- survey results and comparisons for 2012 and 2021
- funding allocations to Extension should improve over time with enhanced program coordination
- county level support for Extension should improve or at least be strengthened with enhanced and well-coordinated programs
- improved economic impact
- greater continuity among all Extension elements should be evident
- more efficient utilization of all Extension FTEs should be provided from a better level of integration across the system

STRATEGIC GOAL 8:

**ASYMMETRIC RESOURCE ALLOCATION IN RESPONSE TO THE GREATEST REGIONAL STRATEGIC NEEDS.**

**A. Current Situation**

CALS Cooperative Extension is often pressured to preserve or maintain positions and program expertise across all regions of the state based on historical or symmetrical expectations. The reality of the strategic needs often highlight the need for certain areas of expertise to be placed or concentrated in geographically related areas. We simply cannot afford to be “all things in all areas.” We need to be more focused and better aligned with respect to geographic needs and the constraints in resources we have available.

**B. Strategies to Achieve Goals**

- i. Regional and strategic priorities need to be assessed and identified for the purpose of placing and directing Extension programs in CALS.
- ii. The full body of Extension faculty needs to understand the strategic and regional priorities for the best direction and management of programs.
- iii. The strategic and geographical Extension priorities need to be clearly communicated at every level.
- iv. An active and continual assessment needs to be developed and implemented to communicate the strategic and geographic priorities of CALS Cooperative Extension.
- v. Greater use of non-continuing track (NCT) faculty needs to be implemented to work in coordination with the regional CT faculty.

**C. Action**

- The Extension Director and the EAT group need to communicate and reinforce a consistent message to all elements of the CALS organization, the UA campus, and across the state and region in terms of areas of need for expertise and the plan for resource allocation and placement.
- Each Extension faculty member should be able to focus and coordinate programs across the CALS Extension system to best address the regional priorities.
- Faculty and staff resources need to be allocated in a manner that is consistent with the strategic and geographic priorities identified.
- Expand non-CT staff and volunteer ranks to best implement and support the Extension mission and function for each area of strategic and regional importance.

**D. Inputs**

- staff, faculty, administrative support, non-CT expertise, volunteers, graduate assistants, work-study students, VISTA, AmeriCorps personnel need to be collectively placed and directed.
- funding needs to be directed towards the identified areas of strategic and geographic priorities
- securing better funding opportunities in CALS Cooperative Extension by working with the stakeholders and the general public of Arizona should be realized through the focused allocation of expertise to best address the Extension priority areas on a geographic basis.

**E. Objective Metrics**

- better coordination and alignment of Extension programs throughout CALS
- levels of engagement with CALS Extension from internal and external constituents
- survey results and comparisons for 2012 and 2021
- funding allocations to Extension



- county level support for Extension
- internal (CALs and UA) support for Extension
- greater interest among students regarding careers in Extension

Department of  
Agricultural and  
Resource Economics

# **AGRICULTURAL AND RESOURCE ECONOMICS 2019-2025 STRATEGIC PLAN**

## **With 2017/ 2019 Updates in Green**

### **PURPOSE**

- Discover new economic knowledge through applied economic research and impart that knowledge to students on-campus and CALS stakeholders throughout the world.
- Contribute to the overall productivity of CALS' scholars and the doubling of CALS external funding through active collaboration on multidisciplinary grants.
- Educate all CALS students in understanding the complexities of commerce in a global economy.
- Ensure CALS' top ranking by playing an integral role in applied economic endeavors regionally and internationally.

### **2025 VISION**

Serve our state, nation, and world through a commitment to the land-grant heritage and tradition of discovery, education, and service. Our tripartite vision is:

- To advance applied economic knowledge through creative research and scholarship.
- To extend applied economic knowledge through innovative educational efforts on- and off-campus.
- To serve our college, university, community and state by promoting learning pertinent to the global economy.

### **MISSION**

Uphold the most rigorous quality standards in pursuit of applied economic knowledge, its application, and its transmission to students, CALS stakeholders and society at large to address pressing social challenges.

### **SHARED VALUES**

Quality and Excellence  
Integrity, Trust and Respect  
Discovery, Innovation, and Creativity  
Land-Grant Ideals  
Diversity and Global Citizenship  
Stewardship and Accountability  
Freedom of Expression

### **PREAMBLE**

For timely and credible economic analysis to be performed in CALS and for meaningful economic education of CALS students, applied economists must have a vibrant, cohesive, identifiable unit within CALS. No top-ranked college of agriculture in the United States maintains its rankings without agricultural economics research and education. Further, agricultural economists play an integral role in garnering multidisciplinary grants in which applied economic analysis is a necessary requirement. Agricultural and resource economists are uniquely qualified to provide essential economic education of on- and off-campus students so that they may prosper and flourish in a global economy.

The following four strategic goals identify the short- and long-run benefits to CALS of the research, teaching and extension only agricultural and resource economists can provide. In the short run, many of

the innovative, exciting opportunities outlined can be realized with current faculty numbers through a reallocation of efforts between teaching and research. Greater benefits to CALS in the longer run will, however, require filling positions vacated owing to retirements and potentially from attrition as well as two new faculty lines. The two new lines will be leveraged in part by alumni and industry donations to an endowed chair as well as allocation of start-up funds from other discretionary sources like restricted UA Foundation accounts at AREC's disposal. With two new lines filled between FY15 and FY17, all the longer run benefits in extension, teaching, and research outlined in the four strategic goals can be realized.

## STRATEGIC GOAL ONE

PROVIDE AN OUTSTANDING UNDERGRADUATE EDUCATION EXPERIENCE IN AGRIBUSINESS AND ENVIRONMENTAL ECONOMICS AND MANAGEMENT THAT PREPARES STUDENTS TO EXCEL IN A GLOBAL SOCIETY

### A. Current situation and gap between current and desired situation:

FY12	180 Agribusiness Economics and Management majors 30 Environmental and Water Resource Economics majors No general education courses One on-line and one pre-session course, with potential for growth 1/2-time advisor 1-unit "success" class for all majors No student clubs Modest informal internship program Limited undergraduate alumni network
FY17-21	200 Agribusiness Economics and Management majors 100 Environmental Economics and Management majors At least two dedicated service or general education global applied economics courses for <u>all</u> CALS majors (as part of Gen Ed requirement for all students) A minimum of four on-line and pre-session courses Active student clubs An actively engaged undergraduate alumni network

**2017/19:** 180 Agribusiness Economics and Management majors  
30 Environmental and Water Resource Economics majors  
General education course to be offered AY2018; another to be added QY2019  
One on-line and one pre-session course, with potential for growth  
1/2-time advisor  
1-unit "success" class for all majors  
Active AREC undergraduate/M.S. club  
Modest informal internship program  
Building undergraduate alumni network

### B. Strategies to achieve goal

1. Revise and refine undergraduate curriculum to highlight industrial organization, international trade, food security and safety, economic development, and environmental management (**in progress**)
2. Develop and maintain new service courses (e.g. general education) that equip CALS and other university students for competition in the global economy. (**in progress**)



3. Develop pre-session and/or online versions of the new service courses to facilitate student access (see strategy 2). **(in progress)**
4. Design a new CALS-or university-wide major in Environmental Economics and Management, replacing the current Environmental and Water Resource Economics major. **(not likely)**
5. Maintain the current analytical, mathematical and statistical rigor in the undergraduate program. Enhance the opportunities for students with aptitudes in these areas. **(in progress)**
6. Promote student diversity and an academic home for “2<sup>nd</sup> chance” students while raising and enforcing stricter entrance requirements for undergraduate majors to insure their academic success.
7. Develop out-of-class opportunities for students (e.g. clubs, field trips, internships, etc.), with the cooperation of a re-energized alumni network, to enhance learning, career development, job placement, and “Bear Down” alumni loyalty. **(AREC Club created 2015)**

<b>C. Actions</b>	<b>Time Period</b>
• Faculty cooperatively review/revise/redirect the content of the undergraduate curriculum.	FY13-15
• Faculty explore the needs within CALS for economic education and then design and establish course opportunities for a broad number of CALS students.	FY13-14
• Faculty utilize CALS and University resources to develop pre-session and on-line courses for high-demand classes.	FY13-15
• Faculty work with faculty from SWES, SNRE, WRRRC, Institute for the Environment, Economics, and Geography to design and establish the new Environmental Economics and Management major.	FY13-15
• Faculty and staff are encouraged to maintain high standards in student advising and assessment. Availability of faculty for student advising is a tradition to be maintained as a critical aspect of students' learning experience.	FY13-21
• The Department establishes two student clubs (e.g. National Agricultural Marketing Association (NAMA), Environmental Management Club) with the assistance of the alumni network.	FY15-17
• Continue collaboration in annual FFA examination and other outreach activities to foster recruitment of freshmen majors.	FY13-21

<b>D. Inputs needed to achieve the goal</b>	<b>Time Period</b>
• Four teaching assistants @ (\$15,000 + ERE) / assistantship	FY 14-21
• Selected faculty teaching 3 courses / year (two undergraduate courses or one course and club advisor) with appropriate department and CALS recognition <b>(Two faculty reassigned with higher teaching loads, 2016: Cory &amp; Dahlgran. Cory retired Dec. 2016. Dahlgran retired May 2019)</b>	FY 13-21
• Full-time Undergraduate Coordinator (funded by fees & donations)	FY 13-21
• Replacement of retiring faculty <b>(none replaced; a Professor of Practice hired Dec. 2016 to start July 2017)</b>	FY 13, 15, 16
• With ABOR approval, implement \$200/student/semester fee. <b>(not yet)</b>	FY13
• Two additional faculty lines <b>(Hired Josephson &amp; Michler)</b>	FY 15-17
• Operational “seed” funding to support efforts to develop and maintain our alumni network	FY 14-15

**E. Objective metrics that will be used to track progress towards obtaining goal:**

1. Revised syllabi, curriculum and courses to support global economics education. **(in progress)**

2. Increased number of teaching assistants (4) . **(Increased by 2 @1/4-time with Tier 1 enrollment of 140+)**
3. 800-1,000 additional students in AREC classes per year. **(SCH ↑)**
4. Generate sufficient funds from online/summer school offerings to support three additional teaching assistants. **(not yet achieved)**
5. 200 Agribusiness Economics and Management majors. **(stationary at 160)**
6. 100 Environmental Economics and Management majors. **(stationary at 30)**
7. 50-80 students providing leadership and regularly participating in club activities.
8. Increased number of faculty (2) **(↓4 TT faculty: 3 retirements, 1 departure )**
9. Increased alumni participation in undergraduate program (visits, field trips, internships, donations, public-private partnerships, etc.) **(AREC Club; Nogales field trips)**

## **STRATEGIC GOAL TWO:**

PROVIDE A PREMIER GRADUATE EDUCATION IN AGRICULTURAL AND RESOURCE ECONOMICS AND ACHIEVE A LEADING POSITION IN TRAINING RISK MANAGEMENT PROFESSIONALS

### **A. Current situation and gap between current and desired situation:**

- FY 12 Current top-10 ranking of AREC M.S. program.  
 No attrition and on-time graduation rates.  
 Diverse graduate student composition (e.g. 4 National Needs Scholars) of 30 students  
 Three Fulbrights and one Muskie Scholar in recent years.  
 100% placement with terminal degree recipients in private sector (e.g. PricewaterhouseCoopers, American Express, KPMG, Discover, JPMorgan/Chase, Citibank) and public sector (e.g. Economic Research Service, Federal Reserve, FAO, Department of Interior, Bureau of Reclamation).  
 Near 100% placement for non-terminal recipients in premier Ph.D. programs (e.g. Berkeley, Cornell, Oxford).  
 Maintained active research and excellent teaching in Applied Econometrics, Economic Development, and Environmental and Resource Economics  
 Foregoing achieved despite loss of 3 faculty and no state funding for RA/TA's.
- FY 15-21 Further improve ranking of M.S. program.  
 Capitalize on the renewed market demand for risk analysis and risk management.  
 Buttress and generate new funding of RA/TA's to continue to recruit very brightest students.  
 Offer new specialized degree in Applied Econometrics and Risk Management with students paying full cost.  
 Maintain position as the premier center for education and training in Agricultural and Resource Economics, and Risk Management.

**2017/19: Have maintained ranking at TFE Times (13<sup>th</sup> of private/public M.S. Economics programs; 8<sup>th</sup> of public universities) <https://tftimes.com/economics-rankings/>  
 Maintained diversity of graduate students  
 One additional Fulbright (Zambia) in 2016  
 Excellent placement in industry/government/NGOs and premiere Ph.D. programs  
 Implemented M.S. subplan titled “Applied Econometrics & Data Analytics” as 18-month M.S. (no thesis) alternative to attract full-paying M.S. students. Subplan is precursor to stand-alone M.S. degree  
 Continued GRA support on grants, predominantly at ¼-time rate**

**B. Strategies to achieve goals:**

1. Continuous systematic review and refining of M.S. curriculum **(always in progress)**
2. Assure that graduate students receive superior opportunities and environment to learn and be mentored
3. Provide graduate students with a strong and nationally recognized core curriculum in quantitative methods and field courses which correspond to industry/Ph.D. demand and faculty expertise
4. Continuously recruit high quality graduate students who can be trained in teaching and research by gainfully employing them as (a) research assistants supported on grants and (b) teaching assistants supported on summer school/Outreach College proceeds for undergraduate courses
5. Offer a new MS degree in Applied Econometrics and Quantitative Risk Management for full paying students. **(Subplan in Applied Econometrics & Data Analytics in second full year)**

<b>C. Actions:</b>	<b>Time Period</b>
• Assure graduate students acquire the tools of economic analysis relevant to performing well in academic and non-academic careers as applied economists.	FY12-21
• Review and refine M.S. curriculum.	FY12-13
• Solicit and obtain new round of National Needs Fellowships from USDA. <b>(new NNF proposal submitted 2018)</b>	FY13-14
• Solicit NSF Master's program support. <b>(to be determined if possible)</b>	
• Build upon existing public-private partnerships and seek new partnerships and internships. <b>(local Tucson employers/partners: TANGO, BASIS, Fontana Group, Raytheon, etc.)</b>	FY 12-21
• Designate a Career Placement Director (for recruitment and placement)	FY 15-21
• Establish and pursue goal of \$1.5M endowment & \$50k in restricted UA Foundation <b>(\$20k+ in restricted accounts at Foundation)</b>	FY 12-21
• Initial offering of self-financed, 3-semester (16 month) M.S. degree in Applied Econometrics and Risk Management. <b>(M.S. subplan in effect)</b>	FY16
• Increase numbers in self-financed M.S. program to 20 students per cohort. <b>(in progress)</b>	FY 17-21

<b>D. Inputs needed to achieve the goal:</b>	<b>Time Period</b>
• Maintain graduate-level expertise in three strategic areas: Applied Econometrics; Economic Development; and Environmental and Resource	FY15-21
• Timely approval of proposal to offer new MS degree in Applied Econometrics and Risk Management.	FY13-14
• Dedicated faculty and CALS Development effort toward \$1.5M & \$50k goals.	FY13-21
• Replacement of retiring faculty (same lines as in Goal 1) <b>(partially)</b>	FY 13,15,16
• Two additional faculty lines (same lines as in Goal 1) <b>(aspirational)</b>	FY 15-17
• Advertising & marketing of full-paying new degree program on website & elsewhere (\$20k annually from restricted UA Foundation accounts, summer school proceeds, etc.)	FY 15-21
• CALS's continued recognition of AREC graduate programs as one of the pillars of its strength and national reputation.	FY15-21

**E. Objective Metrics that will be used to track progress towards attaining goal:**

1. Number of MS degree (Agricultural and Resource Economics) awarded annually
2. Number of MS degree (Applied Econometrics and Risk Management) awarded annually
3. Number of publications coauthored by faculty with current and recent (< 5 years) graduate students
4. Number & amount of external fellowships and scholarships awarded annually
5. Number of awards garnered by graduate students annually
6. Placement records of initial post-graduation job of AREC M.S. students (job title, company, salary)

### **STRATEGIC GOAL THREE:**

ENHANCE REGIONAL RECOGNITION AS THE “GO TO” SOURCE OF RESEARCH-BASED, UNBIASED EXTENSION AND OUTREACH PROGRAMS FOR ADDRESSING SUSTAINABLE ECONOMIC DEVELOPMENT IN THE SOUTHWEST

#### **A. Current situation and gap between current and desired situation:**

FY 12-13: Demand for extension faculty’s participation in economic analyses and program development by Arizona agricultural and natural resource management stakeholders and colleagues in other units is high relative to the 1.95 extension FTE available.

Three extension specialists fully fund their extension program travel, operations, software and database acquisitions through extramural grants, contracts plus other external funds. These funds also provide partial support for AREC extension staff and tribal extension programs. Among AREC extension grants and contracts, ten have Co-PIs with six other units in CALS.

FY 14-15: Enhance capacity of tribal and county agents to respond to stakeholder economic information requests in cooperation with campus-based extension faculty.

FY 14-17: Enhance AREC’s capacity to conduct economic impact analyses by recruiting AREC graduate students that desire to work in this area. These students would be directed to conduct economic impact analyses of diverse regional economic development projects, private sector investments, and CALS programs with an emphasis of measuring benefits to local Arizona economies (personal income, jobs created, return on investment, etc.).

FY 17-21: Have an AREC Extension Assistant that can independently conduct economic impact analyses and communicate these results to lay audiences.

**2017/19: Maintained interdisciplinary grant, research-based programs  
Teegerstrom as director of Federally Recognized Tribal Extension Program for  
Arizona  
Built economic impact analysis/program evaluation unit with leadership of Frisvold  
Hired two economic impact analysts: Kerna, 2013; Duval, 2015.**

#### **B. Strategies to achieve goal**

1. Provide trainings and support materials on economic issues to county and tribal agents. **(yes)**
2. Develop and improve analytical tools, business plans, and marketing plans that increase efficiency and profitability of rural and tribal economic development ventures. **(yes)**
3. Develop in-house capacity for location, sector and technology-specific input-output modeling and energy return-on-investment modeling; provide industry-supported analyses and reports on economic development projects. **(yes)**
4. Continue and expand collaboration with other units in CALS and the UA on multi-disciplinary integrated research and extension grant projects. **(yes)**

5. Support AREC graduate research assistants via extramural grants for integrated research and extension projects; supervise thesis research related to Arizona extension needs. **(yes)**
6. Through extramural funds, hire one of the productive graduate students as an Extension Assistant to address economic impact analyses. **(yes)**

<b>C. Actions</b>	<b>Time Period</b>
<ul style="list-style-type: none"> <li>• Expand collaboration with extension agents and specialists, other UA units and local, state and federal agencies in support of integrated research and extension programs in the following areas:                             <ol style="list-style-type: none"> <li>i. <u>Renewable energy</u> (solar, wind, bio-energy crops, wind, and methane digesters in livestock production),</li> <li>ii. <u>Local food systems</u> (technical assistance for direct farm marketing and agritourism ventures),</li> <li>iii. <u>Land use management</u> (assist rural communities in assessing implications of changes in land use policies and siting of new industries locally),</li> <li>iv. <u>Water</u> (economic assessments of drought impacts, water transfers, and adoption of improved irrigation systems; assessments of water requirements for energy and other new commercial projects),</li> <li>v. <u>Biotechnology</u> (maintain sustainability through contributions to ongoing insect-resistance and herbicide-resistance management programs in the state), and</li> <li>vi. <u>Commodity Outlook</u> (continue providing updated situation and outlook information on livestock and grain commodities to Arizona producers and agribusinesses).</li> </ol> </li> </ul>	FY 12-21
<ul style="list-style-type: none"> <li>• In collaboration with other CALS and UA units, submit extramural grant proposals to support program areas listed above.</li> </ul>	FY 12-21
<ul style="list-style-type: none"> <li>• Develop and strengthen AREC’s graduate student and extension faculty capacity to conduct specific economic impact analyses using proprietary software and data for Arizona including input-output models (using IMPLAN software and data) and energy investment modeling (using HOMER software).</li> </ul>	FY 12-21
<ul style="list-style-type: none"> <li>• Develop an online <i>Arizona Review</i> and email list that is more cost effective than the traditional print and mail version. <b>(yet to be done)</b></li> </ul>	FY 12-21

<b>D. Inputs needed to achieve the goal</b>	<b>Time Period</b>
<ul style="list-style-type: none"> <li>• Current 1.95 extension FTEs. <b>(stationary)</b></li> </ul>	FY 12-21
<ul style="list-style-type: none"> <li>• Participation of tribal and county agents, and extension specialists on collaborative projects.</li> </ul>	FY 12-21
<ul style="list-style-type: none"> <li>• Funding from industry sources to support commissioned analyses and reports. <b>(\$30k+ UA Foundation restricted accounts)</b></li> </ul>	FY 12-21
<ul style="list-style-type: none"> <li>• Proprietary data and software for specialized economic analyses.</li> </ul>	FY 15 -21
<ul style="list-style-type: none"> <li>• Graduate students (2-3 per year). <b>(1-2 per year achieved)</b></li> </ul>	FY 12-21

**E. Objective metrics that will be used to track progress towards attaining goal**

- Number and amount of industry, tribal, and institutional donations made to AREC's extension pathway foundation account.
- Number and amount of extramural grants and contracts received.
- Number of graduate students supported and AREC MS theses completed that involve integrated research and extension projects.
- Number of economic impact studies conducted.
- Number of economic presentations and publications to limited-resource farmers and ranchers.
- Number of economic presentations by extension faculty-mentored tribal agents.
- Number of participants in local food systems training.
- Number of participants in renewable energy trainings.
- Adoption of new energy systems.
- Number of business plans created and implemented by limited resource farmers and ranchers.
- Extension FTE hours supported by extramural grants and contracts.

## STRATEGIC GOAL FOUR

PROVIDE NATIONALLY AND INTERNATIONALLY RECOGNIZED RESEARCH IN SUPPORT OF MULTIDISCIPLINARY GRANTS, EXTENSION, AND ON-CAMPUS TEACHING.

### A. Current situation and gap between current situation and desired situation:

- FY12: Competitive grants & contracts generated by about half the faculty.  
Department ranking in agricultural & resource economic research dropped several places from #8 in 2005.  
Current areas of research strength include sustainable water management in arid regions, regional economic adaption to drought and climate change, and applied economic analysis.
- FY17: Enhance grantsmanship participation rate to include more than half the faculty.  
Target grant and contracts to increase by 40% over the 2012 level.  
Improve department ranking in research.
- FY21: Competitive grants & contracts generated by a majority of faculty doubling the 2012 total.  
Restore departmental research ranking to at least #8.

**2017/19: Per capita grantsmanship stable**  
**Departmental research ranking ↓ with 3 retirements and 1 departure of TT faculty**  
**With reduced faculty numbers, now well over half of faculty actively bringing in grants**

### B. Strategies to achieve goal:

1. Communicate that the value of applied economic research is measured in more than just indirect cost dollars generated. **(MTDC, graduate student support, program mission and excellence)**
2. Develop a departmental and college culture in which applied economic research is valued and respected. **(Extension economic impact analysis now highly valued inside CALS & with external stakeholders)**
3. Communicate the importance of economic research in teaching to undergraduate and graduate students, university colleagues, and off-campus stakeholders.
4. Encourage and foster enhanced research productivity in all its manifestations.
5. Augment collaboration and partnerships with researchers within the college and throughout the university.
6. Foster stimulating intellectual climate in the department/unit in order to hire and retain best faculty.

<b>C. Actions</b>	<b>Time Period</b>
• Provide timely postings of research contributions and findings on unit and CALS websites. <b>(done &amp; continues to be done)</b>	FY12-21
• Give “visiting” seminars in other CALS units highlighting relevance of applied economic research. <b>(in progress)</b>	FY12-21
• Semi-annual advisory council meetings & other professional forums communicating departmental research value added to society. <b>(in progress)</b>	FY12-21
• Regular brown bag seminars by faculty and graduate students <b>(yes)</b>	FY12-21
• Establish & maintain regular multidisciplinary-focused seminar series <b>(yes)</b>	FY12-21
• Regular seminar series with visiting scholars engaged in collaborative research	FY12-21

#### **D. Inputs needed to achieve goal:**

• \$50k for website activity (10 years @ \$5k/year from grants, contracts & donations) <b>(departmental website makeover, 2015 @ \$4k; makeover 2019)</b>	FY12-21
• Involvement of Center for Sustainable Economic Development (see Goal 3)	FY12-21
• \$25k for advisory council/professional events (5 @ \$5k/event)	
• Replace 3 retiring full professors with assistant professors, sharing any difference in salary between CALS and unit (same as in Goals 1 – 3)	FY 13,15,16
• 2 additional assistant/associate professors with startup of \$40k / line; alumni & industry donations will cover startup (same lines as in Goals 1 – 3) <b>(aspirational at best)</b>	FY 15 - 17

#### **E. Objective metrics that will be used to track progress towards attaining goal**

1. Number of grant proposals submitted & success rate
2. Dollar amount of grant proposals funded
3. Number of manuscripts submitted and ultimately published
4. Impact factors of published research
5. Amount of monetary and non-monetary research support from alumni
6. Amount of monetary and non-monetary research support from industry/clientele groups
7. Number of undergraduate students participating in research projects
8. Number of research website hits
9. Number of alumni research events
10. Number of industry/clientele research events

#### **ADMINISTRATIVE ACCOMPLISHMENTS NOT ADDRESSED IN 5 STRATEGIC GOALS**

- Merging of business office functions with Agricultural Education and Family and Consumer Sciences (2013)
- Move from Chávez Building to McClelland Park (2016)

Department of  
Agricultural Education,  
Technology and  
Innovation





THE UNIVERSITY OF ARIZONA  
COLLEGE OF AGRICULTURAL & LIFE SCIENCES

# Agricultural Education, Technology & Innovation



AETI 2025 Strategic Plan

Adopted by faculty and staff November 2020

"The bounty of the harvest is dependent on the quality of the seed"

# Purpose, Mission, Vision, and Values

## Purpose

The Department of Agricultural Education, Technology and Innovation contributes to the College's unique functional role as a leader in the University's land-grant mission by providing an array of programs in formal undergraduate and graduate instruction, research, and service to enable the people of Arizona, the nation, and beyond to improve the quality of their lives.

The strength of the Department is firmly grounded in its nationally recognized faculty, who in a positive and proactive manner, are student-centered, committed to educational excellence and to addressing the challenges and opportunities presented by the current climate of change within the College, the University, the nation, and the world.

## Mission

The primary mission of the Department is serving a diverse population through teaching, application, integration, and discovery in agriculture, education, and applied science and technology leading to successful careers in agricultural education, technology and innovation and related businesses and industries.

## Vision

We engage the leadership of the future in Agricultural Education, Technology and Innovation by providing a better quality of life through a knowledge base in agricultural technology and systems management, formal and non-formal education, and leadership and innovation for our students, the people of Arizona, and society.

## Shared Values

We are student-centered and value:

- Quality teaching and student advising
- High standards of professionalism, performance, and practice
- A positive learning environment for students, staff, and faculty
- Continuous professional development for faculty and staff
- Teamwork and open communication
- Diversity, inclusion, and mutual respect

## Overview of Department Goals

1. Prepare thoughtful, informed, marketable individuals for careers in agricultural education, technology, innovation and related fields (Graduates)
2. Prepare individuals to plan, and deliver and advance agriculture, food, natural resources, and related content (Curriculum Area)
3. Advance knowledge of and competencies in agricultural technology and systems through implementation, maintenance, and management (Curriculum Area)
4. Be the principle platform in CALS for entrepreneurial leadership and innovation to include students, faculty, and community stakeholders (Curriculum Area)
5. Contribute to the knowledge base in the agricultural education, technology and innovation profession (Research)
6. Generate sufficient resources to sustain and advance program goals (Finance)



# Strategic Goal I

## PREPARE THOUGHTFUL, INFORMED, MARKETABLE INDIVIDUALS FOR CAREERS IN AGRICULTURAL EDUCATION, TECHNOLOGY, INNOVATION AND RELATED FIELDS.

A. Current situation (i.e. problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation:

Current	Gap	Desired
<ul style="list-style-type: none"> <li>• Non-traditional student backgrounds</li> <li>• Unrealized career opportunity</li> <li>• Low student numbers</li> <li>• High tuition cost</li> <li>• Limited scholarship opportunity</li> <li>• Curriculum (content) changes</li> </ul>		<ul style="list-style-type: none"> <li>• An increased number of students in each option area</li> <li>• Concentrated efforts on recruitment and retention of a diverse student body</li> <li>• Increased financial support for students in all option areas</li> <li>• Expanded experiential opportunities</li> <li>• Enhanced facility resources</li> <li>• Increased graduation rate</li> </ul>

B. Strategies to achieve goal:

1. Establish a recruitment and retention plan to increase student enrollment and retention
2. Integrate technology and environmental changes in curriculum revision
3. Enhance student services and learning experiences
4. Seek nominations for awards and honors
5. Secure financial support for student advancement
6. Deliver high quality, market-informed, and competency-based undergraduate and graduate curriculum

C. Actions	Completion Goal
<ul style="list-style-type: none"> <li>• Prepare, develop, and update recruitment and retention plan</li> </ul>	Ongoing
<ul style="list-style-type: none"> <li>• Engage industry, alumni, and education partners</li> </ul>	Ongoing
<ul style="list-style-type: none"> <li>• Partner with UA and CALS units for undergraduate and graduate curriculum needs</li> </ul>	Ongoing
<ul style="list-style-type: none"> <li>• Cultivate relationships with perspective and current students via the Student Undergraduate and Graduate Advisor</li> </ul>	Ongoing
<ul style="list-style-type: none"> <li>• Arrange for student/faculty interactions through social gatherings and activities</li> </ul>	Ongoing
<ul style="list-style-type: none"> <li>• Update marketing and promotional materials and social media outreach</li> </ul>	Ongoing
<ul style="list-style-type: none"> <li>• Secure scholarships through relationships and partnerships with alumni and industry</li> </ul>	Ongoing
<ul style="list-style-type: none"> <li>• Encourage faculty and staff to attend workshop or training opportunities related to diversity and inclusion</li> </ul>	Ongoing

## Strategic Goal I (Continued)

### PREPARE THOUGHTFUL, INFORMED, MARKETABLE INDIVIDUALS FOR CAREERS IN AGRICULTURAL EDUCATION, TECHNOLOGY, INNOVATION AND RELATED FIELDS.

#### D. Inputs needed to achieve the goal (do not limit to financial inputs):

- Faculty and student engagement
- Student worker(s)
- Stakeholder and advisory group input and collaboration
- Marketing and promotion materials

#### E. Objective Metrics that will be used to track progress towards attaining goal:

- To increase total undergraduate enrollment by:
  - 5% in five years (FY25)
  - 15% in 10 years (FY30)
  - 25% in 15 years (FY35)
- To increase total graduate enrollment by:
  - 30% in five years (FY25)
  - 50% in 10 years (FY30)
  - 75% in 15 years (FY35)
- Achieve and maintain an overall retention rate of 85% (FY25)

#### Notes:

Use 2020 enrollment and retention data as the benchmark metric



## Strategic Goal II

### PREPARE INDIVIDUALS TO PLAN AND DELIVER AND ADVANCE AGRICULTURE, FOOD, NATURAL RESOURCES, AND RELATED CONTENT.

**A. Current situation** (i.e. problem to overcome/opportunity to capitalize on) **and gap between current situation and desired situation:**

Current	Gap	Desired
<ul style="list-style-type: none"> <li>• Prepare school-based agricultural education (SBAE) teachers</li> <li>• SBAE programs growing in AZ</li> <li>• Sole SBAE teacher prep program in AZ</li> <li>• ADE alternative certified short-term solution to the growing need for CTE teachers</li> <li>• Loss of CTE philosophy for program delivery from alternatively certified CTE teachers</li> </ul>		<ul style="list-style-type: none"> <li>• Produce an abundant supply of highly qualified SBAE teachers</li> <li>• Become the premier provider of certifiable SBAE teachers for Arizona and neighboring states</li> <li>• Highly engaging and needs-based teacher preparation curriculum</li> </ul>

**B. Strategies to achieve goal:**

1. Establish curriculum partnerships with academic units in CALS
2. Integrate current research on teaching and learning within instruction and service
3. Strengthen connections with formal and non-formal education stakeholders
4. Investigate opportunities to advance undergraduate and graduate instruction in high needs areas
5. Model and promote the use of inclusive pedagogy

C. Actions	Completion Goal
<ul style="list-style-type: none"> <li>• Work with the Arizona Department of Education (ADE) teacher certification</li> <li>• Work with Local Education Agencies (LEAs) and CTE Directors</li> <li>• Prepare a suite of CTE professional knowledge courses for online delivery</li> <li>• Increase marketing and awareness of curriculum and/or career pathways</li> <li>• Partnership with LEA/ADE/JTED (Joint Technical Education Districts)/Alumni</li> <li>• Promote and enhance the Accelerated Master’s Program (AMP) for CTE Teacher Certification with other units</li> <li>• Provide professional growth opportunities for SBAE teachers through induction activities</li> <li>• Advance agricultural literacy topics among consumers</li> <li>• Integrate the CASE curriculum into the plan of study</li> <li>• To seek approval of an academic minor in Agriculture and Life Science Education</li> <li>• Identify and articulate the essential competencies associated and desired for this curriculum path</li> </ul>	<p>Ongoing</p> <p>Ongoing</p> <p>FY22</p> <p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p> <p>FY22</p>

**D. Inputs needed to achieve the goal (do not limit to financial inputs):**

- Marketing and promotional materials and venues
- Collaboration with other CALS units, LEA, ADE, JTED, and Alumni
- Stakeholder group support
- Arizona Teachers Academy Funding

## Strategic Goal III

### ADVANCE KNOWLEDGE OF AND COMPETENCIES IN AGRICULTURAL TECHNOLOGY AND SYSTEMS THROUGH IMPLEMENTATION, MAINTENANCE, AND MANAGEMENT.

**A. Current situation** (i.e. problem to overcome/opportunity to capitalize on) **and gap between current situation and desired situation:**

Current	Gap	Desired
<ul style="list-style-type: none"> <li>• Aging laboratory facilities</li> <li>• Need for equipment repair and replacement</li> <li>• Untapped use of industry and business partnerships</li> <li>• Expanded AGTM course offering</li> <li>• AGTM course enrollment remains high in majority of courses each semester</li> <li>• One faculty instructs AGTM lecture/laboratory courses.</li> </ul>		<ul style="list-style-type: none"> <li>• Expanded contemporary and multi-functional laboratory facilities</li> <li>• State of the art equipment and tools to deliver experiential experience</li> <li>• Engage industry and business partnerships</li> <li>• Expand facilities to address dynamic curriculum content</li> <li>• Increase number of teaching faculty in AGTM courses.</li> <li>• Further expand the AGTM curriculum into emerging technologies including Precision Agriculture</li> </ul>

**B. Strategies to achieve goal:**

1. Partner with business and industry to leverage resources to maintain curriculum relevance
2. Create a safe laboratory environment equipped with essential machinery, tools, and supplies
3. Identify potential industry partners and establish relationships for internships, post graduate placement, sponsorships, and other funding opportunities
4. Secure funding to replace, repair, and purchase laboratory equipment and supplies
5. Investigate opportunities to advance undergraduate and graduate instruction in high needs areas

C. Actions	Completion Goal
<ul style="list-style-type: none"> <li>• Explore strategic alliances with business and industry to showcase equipment, tools, and supplies to students enrolled in AGTM courses</li> </ul>	FY25
<ul style="list-style-type: none"> <li>• Apply for UA GreenFunds that align with current curriculum competencies</li> </ul>	FY25
<ul style="list-style-type: none"> <li>• Develop and maintain a record of potential industry partners who can provide internship, prospective placement occupations, and funding opportunities</li> </ul>	Ongoing
<ul style="list-style-type: none"> <li>• Maintain an up-to-date inventory of equipment, tools, and supplies</li> </ul>	FY25
<ul style="list-style-type: none"> <li>• Work closely with CALS Development office to secure funding to expand and maintain safe laboratory facility</li> </ul>	Ongoing
<ul style="list-style-type: none"> <li>• Establish a partnership with the WakWay Foundation to support efforts to integrate the teaching of Precision Ag/agriculture drone operations in ATGM courses</li> </ul>	FY25
<ul style="list-style-type: none"> <li>• Increase marketing and awareness of curriculum and/or career pathways</li> </ul>	Ongoing
<ul style="list-style-type: none"> <li>• Identify and articulate the essential competencies associated and desired for this curriculum path</li> </ul>	FY22
<ul style="list-style-type: none"> <li>• Work with the departments of Plant Science, Entomology, Food Safety, and AETI to develop a distance master's program</li> </ul>	FY23

## Strategic Goal III (Continued)

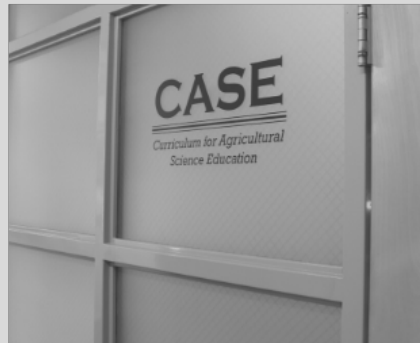
### ADVANCE KNOWLEDGE OF AND COMPETENCIES IN AGRICULTURAL TECHNOLOGY AND SYSTEMS THROUGH IMPLEMENTATION, MAINTENANCE, AND MANAGEMENT.

#### D. Inputs needed to achieve the goal (do not limit to financial inputs)

- Faculty and staff
- Collaboration with other CALS units, business and industry partners
- Stakeholder group support
- Marketing and promotion materials

#### E. Objective Metrics that will be used to track progress towards attaining goal.

- To increase the number of industry partners by 10% each year
- To maintain 90% functionality of essential machinery, tools, and supplies
- To expand and or modify curriculum offerings to be consistent with the market demand





## Strategic Goal IV

### BE THE PRINCIPLE PLATFORM IN CALS FOR ENTREPRENEURIAL LEADERSHIP AND INNOVATION TO INCLUDE STUDENTS, FACULTY, AND COMMUNITY STAKEHOLDERS.

**A. Current situation** (i.e. problem to overcome/opportunity to capitalize on) **and gap between current situation and desired situation:**

Current	Gap	Desired
<ul style="list-style-type: none"> <li>• Capacity both in terms of scope and scale is robust given the addition of courses created (ALC 196A, ALC 514, ALC 497/597) in combination with those previously established (ALC 409/509, 410/510, ALC 411/511).</li> <li>• Enrollment growth, both in terms of courses and degree, has not followed course creation.</li> </ul>		<ul style="list-style-type: none"> <li>• Enrollment growth both in terms of new AETI majors (leadership &amp; communication emphasis) and course enrollments of non-AETI majors</li> <li>• Revenue generation to advance curriculum experiences</li> <li>• Partnerships within the College (e.g., SNRE, AREC, Norton) and beyond (e.g., PAH RLR emphasis)</li> <li>• DLC “integration” with entrepreneurial mindset course</li> <li>• Grant contributions</li> </ul>

**B. Strategies to achieve goal:**

1. Initiate a robust professional marketing and promotion strategy
2. Establish new and expand existing intra- and inter-college partnerships
3. Create new and expand existing revenue streams
4. Expand and enhance ALC curricular reach and offerings
5. Investigate opportunities to advance undergraduate and graduate instruction in high needs areas

C. Actions	Completion Goal
<ul style="list-style-type: none"> <li>• Establish international program(s) to provide students with international experiences</li> </ul>	FY25
<ul style="list-style-type: none"> <li>• Integrate ALC courses with degree programs outside of AETI</li> </ul>	FY25
<ul style="list-style-type: none"> <li>• Secure third-party expertise on marketing and promotion strategies (contract-based marketing initiatives)</li> </ul>	FY22
<ul style="list-style-type: none"> <li>• Increase curriculum space within Arizona Online</li> </ul>	FY22
<ul style="list-style-type: none"> <li>• Increase marketing and awareness of curriculum and/or career pathways</li> </ul>	Ongoing
<ul style="list-style-type: none"> <li>• Identify and articulate the essential competencies associated and desired for this curriculum path</li> </ul>	FY22

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Marketing expertise
- Program-specific recruitment and online advising
- Professional grant writing support

## Strategic Goal IV (Continued)

### **BE THE PRINCIPLE PLATFORM IN CALS FOR ENTREPRENEURIAL LEADERSHIP AND INNOVATION TO INCLUDE STUDENTS, FACULTY, AND COMMUNITY STAKEHOLDERS.**

#### **E. Objective Metrics that will be used to track progress towards attaining goal.**

- Increase in number of students in ALC courses and leadership & communication degree program
- Establish consulting arrangement with a marketing agency
- Number of curricular partnerships in place and grant applications submitted that specifically involve ALC course delivery
- Number of online ALC course deliveries & associated amounts of revenue generated
- Number of new sections of existing ALC courses added and/or increase in seats available and filled in existing ALC course offerings



## Strategic Goal V

### CONTRIBUTE TO THE KNOWLEDGE BASE IN THE AGRICULTURAL EDUCATION, TECHNOLOGY AND INNOVATION PROFESSION.

**A. Current situation** (i.e. problem to overcome/opportunity to capitalize on) **and gap between current situation and desired situation:**

Current	Gap	Desired
<ul style="list-style-type: none"> <li>• Low, nonexistent financial support for social science research</li> <li>• Not recognized for social science research</li> </ul>		<ul style="list-style-type: none"> <li>• The faculty will be known for research in the social sciences</li> <li>• Research faculty maintain an active research program leading to dissemination of findings</li> </ul>

**B. Strategies to achieve goal:**

1. Establish an extensive and dynamic research program among faculty with research appointments
2. Align departmental research initiatives with professional association research priorities
3. Mentor graduate students in planning, implementing, and dissemination of research

C. Actions	Completion Goal
<ul style="list-style-type: none"> <li>• Seek intra/extra mural funding for research</li> <li>• Increase and publish research findings in journals, posters, and papers</li> <li>• Promote the dissemination of research findings through one-page research synopses, publicizing research with stakeholders, and increasing efforts to discuss research via platforms including podcasts and informal publications.</li> <li>• Seek increased funding to support expanding Graduate Teaching Assistant positions for all curriculum areas within AETI</li> </ul>	<p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p>

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Faculty
- Six graduate research assistants
- Grant assistant personnel

**E. Objective Metrics that will be used to track progress towards attaining goal.**

- Increase the level of research activity within the department establishing 2-3 research multidisciplinary research teams within the University and nationally within five years.
- Increase the number of referred publications and presentations by 10% within five years (FY25) and 30% within 10 years (FY30).
- Seek extramural funding (\$250k) via federal and state grants, as well as private business sponsorships to sustain 3 to 5-year research projects.

## Strategic Goal VI

### OBTAIN SUFFICIENT RESOURCES TO SUSTAIN AND ADVANCE PROGRAM GOALS.

**A. Current situation (i.e. problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation:**

Current	Gap	Desired
<ul style="list-style-type: none"> <li>• Limited student scholarship opportunity</li> <li>• Need for facility and equipment update and repairs</li> <li>• Financing required to expand recruitment, retention, research, and course offerings.</li> <li>• Lack of marketing and promotion of curriculum, research, and service outcomes.</li> </ul>		<ul style="list-style-type: none"> <li>• Increased scholarship opportunities for students</li> <li>• Adequate resources to update and maintain facilities and equipment required to deliver contemporary instruction related to agricultural education, technology, entrepreneurship, and innovation</li> <li>• Leverage cooperation and collaboration with other researchers, agencies, and philanthropists.</li> </ul>

**B. Strategies to achieve goal:**

1. Create and implement a five-year development plan
2. Enhance relationship with alumni and engage alumni in development effort
3. Pursue revenue generating opportunities through summer, distance, and online instruction
4. Partner with private sectors, non-profit sectors, and/or private foundations in support of teaching, research and outreach
5. Secure financial resources for student scholarships
6. Cultivate relationships with stakeholders, agencies, business, industry, and organizations

C. Actions	Completion Goal
<ul style="list-style-type: none"> <li>• Create and implement a five-year development plan; work closely with CALS Development office team members</li> </ul>	Ongoing
<ul style="list-style-type: none"> <li>• Pursue revenue generating opportunities through summer, distance, and online instruction</li> </ul>	Ongoing
<ul style="list-style-type: none"> <li>• Seek funding for research by participating in grant funding</li> </ul>	Ongoing
<ul style="list-style-type: none"> <li>• Increase and publish research findings in journals, posters, and papers</li> </ul>	Ongoing
<ul style="list-style-type: none"> <li>• Promote within CALS the published research findings</li> </ul>	Ongoing

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Faculty and business staff
- Six graduate research assistants
- Grant assistant personnel
- CALS Foundation assistance

**A. Measurable Objectives**

- Avoid deficit spending
- Generate instructional revenue of \$150k annually from instructional revenue.
- Generate indirect cost through grants and contracts of \$2k
- Invest in curriculum activities and faculty to increase SCH and instructional revenue

School of Animal and  
Comparative  
Biomedical Sciences

## ANIMAL AND COMPARATIVE BIOMEDICAL SCIENCES 2019-2025 STRATEGIC PLAN

Note: The mission, vision and shared values presented below were recently revised and updated from the original 2013-2021 Strategic Plan. All members of the ACBS faculty were given the opportunity to participate in their review. As much as is possible, they represent the general consensus of participating faculty.

### Vision

The School of Animal and Comparative Biomedical Sciences will be a leader in improving the lives of humans and animals through the excellence of our people, our innovative and multidisciplinary research, and our teaching and Extension programs. We will strive to transfer the knowledge from our programs, from basic research to applied, in ways that will advance and improve human and animal health and welfare throughout the state of Arizona, region, and the world.

### Mission

We are committed to improving animal and human health and welfare through our research, teaching, and Extension programs.

Achieving our mission will require us to:

- Deliver **effective educational programs** that are focused on interactive, experiential, and hands-on learning so that our **students become employable and successful global citizens**.
- Create and support **innovative research and Extension programs** that provide products and services that inform, bring solutions to industry problems and respond to the evolving **One Health needs of our state, the nation and globally**.
- Foster a **collaborative environment** that embraces and integrates **diverse individual strengths and talents** of students, faculty, and staff and **recognizes their accomplishments**.
- Maintain a culture of **mutual respect, accountability, honesty, integrity, and shared responsibility** that appreciates all contributions to the Land Grant Mission.

### Shared Values:

- Innovation
- Quality
- Multidisciplinarity
- Collegiality

- Teamwork
- Integrity
- Equality

- Transparency
- Accountability
- Collaboration

## STRATEGIC GOALS AS OF 2013-2021 PLAN

Note: These goals have not been updated and correspond to the strategic plan proposed in 2013. The School is scheduled to have a retreat in December 2019 to review and update them.

### **STRATEGIC GOAL ONE: Enhance food safety education and research through development of a food safety center**

#### **A. Current situation and gap between current situation and desired situation**

Many job opportunities exist for students trained in food safety. Several faculty members are involved in research of current Food Safety issues focused upon by several funding agencies. In 2012, The Food Safety Consortium hosted its third annual meeting which involved faculty, students, industry partners and government agencies. This Consortium was well received. Additional collaborative and extension food safety programs are in place and gaining some prominence. However, currently there is an inadequate ability to fully train undergraduate or graduate students in the Food Safety area. This is due, in part, to a lack of facilities, equipment, funding, and/or faculty in the field.

#### **B. Strategy/ies to achieve goal (list if more than one)**

1. Develop the Southwest Food Safety Center of Excellence that encompasses the Current Food Safety Consortium faculty and resources and allows for greater investment in facilities, equipment, and faculty to effectively meet outreach, teaching and research goals.
2. Intensify consumer education through outreach programs that target food safety issues
3. Provide HACCP certification for small businesses and retail outlets
4. Seek additional industry collaboration and funding
5. Develop partnerships with the fresh produce growers in Yuma, AZ
6. Develop international training program
7. Beginning of collaboration with culinary groups to intensify food safety training (Pima CC, Tucson Culinary Arts)

#### **C. Actions and Time Period (Fiscal Years)**

- |  |               |
|--|---------------|
| • Intensify work with Public Health Officials          | FY2013-FY2014 |
| • Develop Southwest Food Safety Center of Excellence   | FY2013-FY2014 |
| • Increase participation and funding from Industry     | FY2013-FY2021 |
| • Start a Graduate Program in Food Safety Sciences     | FY2014-FY2015 |
| • Create an associated Food Safety Degree Program      | FY2014-FY2015 |
| • Strategic hire for Food Safety teaching and research | FY2014-FY2015 |
| • Add more Food Safety focused classes                 | FY2014-FY2016 |
| • Continue to seek funding from government agencies    | FY2013-FY2021 |

#### **D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Investment in faculty and equipment for food safety related research
- Development of new faculty in food safety field
- Expanded facilities, and increased collaboration with existing facilities including the



Agricultural Facilities both on campus and in Yuma

**E. Objective metrics that will be used to track progress towards attaining goal**

- Development of food safety center with research, teaching, and outreach aims
- Graduate and undergraduate student enrollment
- Research Funding
- Publications
- Industry participation and collaboration in food safety research
- Utilization of facilities and equipment for food safety research
- Number of hits on the website

**Notes (if any)**

**STRATEGIC GOAL TWO: Maintain and strengthen the Environmental Biology Program (Physiology, Nutrition, Reproduction/Perinatal Environment) that utilizes the unique facilities at the ARC**

**A. Current situation and gap between current situation and desired situation**

Currently, a strong program and faculty is limited by an under-developed facility. There has been loss of faculty due to limited resources. We have 1 senior faculty and 2 new junior faculty members who study different aspects of nutrition. The recent hire of an extension beef person trained in nutrition provides a critical mass for integrated research in nutrition. There is a strong interest/expertise in areas that are priorities of funding agencies such as:

- Impact of global warming/Adaptation to hot environments
- Obesity
- Effect on intra-uterine growth
- Pre- and Peri-natal programming
- Control of feed/food intake

**B. Strategy/ies to achieve goal (list if more than one)**

1. Develop a physical plan to complete facilities to best meet the need of current and future faculty
2. Raise money through grants/gifts
3. Form a Center for the Study of Global Warming Impacts on Domestic Animals including members from Agricultural and Biosystems Engineering, Animal and Comparative Biomedical Sciences, Agricultural Economics, and Soil and Natural Resources
4. Form a Center for the Study of Obesity including members from Animal and Comparative Biomedical Sciences, Nutrition, Physiology, and the Norton School of Family and Consumer Sciences.

**C. Actions and Time Period (Fiscal Years)**

- |  |               |
|--|---------------|
| • Complete blueprint for new facilities at ARC                               | FY2013-FY2014 |
| • Develop Center for the Study of Global Warming Impacts on Domestic Animals | FY2013-FY2015 |
| • Develop Center for the Study of Obesity                                    | FY2013-FY2015 |
| • Fundraising for existing and new ARC facilities                            | FY2013-FY2016 |
| • Construction of New Facilities at ARC                                      | FY2014-FY2016 |

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Leadership
- Plans from faculty teams that share common research, teaching, and extension goals in nutrition, reproduction, environmental physiology, and food safety
- Funding

**E. Objective metrics that will be used to track progress towards attaining goal**

- Blueprints for new facilities
- Centers Established
- Faculty teams formed
- Publications
- Grant Funding
- Graduate student quality and quantity
- Funding benchmarks
- Building completion

**Notes (if any)**

### **STRATEGIC GOAL THREE: Strengthen and Support Existing Genomics and Bio-Informatics Endeavors**

#### **A. Current situation and gap between current situation and desired situation**

There are opportunities for faculty in the school to expand their research programs by incorporating elements of bio-informatics and/or genomics. This is an opportunity that is not being met due to problems with access.

There is also the need for undergraduate and graduate training in bio-informatics so that students have the skills necessary to access the future job markets.

#### **B. Strategy/ies to achieve goal (list if more than one)**

1. Develop Bioinformatics courses for graduate and undergraduate students
2. Provide outreach and training for faculty and postdoctoral fellows within the school
- 3 Provide cyberinfrastructure for the school personnel to acquire, manage, analyze and visualize large genomics data sets. This may be provided at a departmental, college or institute level and should include leveraging links with existing campus initiatives.

#### **C. Actions and Time Period (Fiscal Years)**

- Add undergraduate and graduate genomics/bioinformatics course
- Increase awareness of existing cyber infrastructure and identify unmet needs
- Provide training workshops for interested faculty and postdoctoral fellows

#### **D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Faculty and TA time commitment to developing new course work
- Access to training opportunities (including registration, travel costs)
- Strengthen links to UA core genomics facilities (such as CGC, BIO5)
- Access to data storage and analytics

#### **E. Objective metrics that will be used to track progress towards attaining goal**

- Number of grant submissions with bio-informatics/genomics components
- Number of our school student's that complete bio-informatics training
- Number of faculty and postdoctoral fellows attending new training opportunities
- Increase in high throughput data submissions to public repositories

**Notes (if any)**

## **STRATEGIC GOAL FOUR: Maintain and Strengthen Reproductive Physiology Discipline In Animals and Humans**

### **A. Current situation and gap between current situation and desired situation**

The Animal Scientists of the school are working to develop a leading teaching and research resource in Reproductive Biology at the UA. Recent hires in this area provide expertise in follicular development (Craig), luteal physiology (Bogan), and neuroendocrinology (Renquist). The school houses established programs in fetal physiology, endocrinology, and pathophysiology (Limesand) and applied equine reproduction techniques and breeding management (Arns).

### **B. Strategy/ies to achieve goal (list if more than one)**

1. Form a research program (or center) designed to improve animal and human reproduction
2. The newly formed team of researchers will capitalize on individual researcher interests and expertise to address current issues in female reproduction performance, environmental limitations (e.g. heat stress and toxicology), and human health complications associated with sexual dimorphism
3. An additional faculty member in male reproduction will complete the currently assembled team's expertise and be able to interact with Dr. Sheldon Marks at the International Center for Vasectomy Reversal.
4. Creation of the reproductive program will provide mentoring to young scientists and form collaborations that benefit basic research, undergraduate and graduate training, and production management for both established and new faculty
5. Complete facilities at Agricultural Research Center that support basic research in animal models for reproduction and pregnancy (sheep)
6. Ensure that new hires in reproductive physiology, and other aspects of basic science disciplines, add new expertise that compliments new and current research programs.
7. Collectively the researchers will use sheep as an animal model for other livestock industries and human health, which will require a flock for both research and teaching purposes. This will need to be developed as a self-sustaining unit at the UA.
8. Strengthen interactions with clinicians in Ob/Gyn at the UA – resident and fellowship training as well as translational research
- 4.9. Strengthen interactions with academic programs: physiology, pharmacology, and BIO5

### **C. Actions and Time Period (Fiscal Years)**

- |   |                |
|---|----------------|
| • Develop research teams and global research goals        | FY 2013-2016   |
| • Establish Program/Center in Reproductive Biology        | FY 2013-2015   |
| • Develop facilities at ARC to accommodate research goals | FY 2014-FY2015 |

### **D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Cooperation amongst faculty to develop research projects that utilize the team's expertise
- Development of facilities
- Additional expertise in male reproduction, bioinformatics, statistical analysis, computational biology, and endocrinology

### **E. Objective metrics that will be used to track progress towards attaining goal**

- Grants (individual and multi PI funding from NIH, USDA, and private foundations)
- Generation of new knowledge that is presented as peer reviewed reports, but also translate in to increased animal fecundity and performance and improved women's health
- Collaborations with private and academic programs in UA, Tucson, and Arizona

### **Notes (if any)**

**STRATEGIC GOAL FIVE : Maintain Existing Unique Shrimp Pathology and Aquaculture Program**

**A. Current situation and gap between current situation and desired situation**

The current program has impressive ties to the industry and outstanding faculty and facilities in place. However, low faculty numbers limit course offerings and program longevity.

**B. Strategy/ies to achieve goal (list if more than one)**

1. Increase awareness of current program features
2. Encourage long term maintenance of existing facilities

**C. Actions and Time Period (Fiscal Years)**

- |   |             |
|---|-------------|
| 1. Continue existing course offerings and graduate study                              | FY2013-2021 |
| 2. Maintain industry collaboration and continue to seek outside funding opportunities | FY2013-2021 |

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

1. Continued faculty and administrative support

**E. Objective metrics that will be used to track progress towards attaining goal**

1. Relevant course and graduate studies enrollment
2. Research funding and publications

**Notes (if any)**

**STRATEGIC GOAL SIX: Expand international focus of Race Track Industry Program (RTIP)**

**A. Current situation and gap between current situation and desired situation**

The RTIP is a unique program with international recognition. It sponsors a yearly Race Track Symposium that boasts about 18% international attendance. In addition, RTIP has both a successful graduate and undergraduate program and has produced hundreds of alumni who have gone out to work in the industry. In 2006 a master's degree program was started. The graduate program is currently limited due to resources and it could grow.

**B. Strategy/ies to achieve goal (list if more than one)**

1. Increase attendance at the Global Symposium on Racing & Gaming by expanding our international focus
2. Continue exchange programs with the 2 Irish Universities
3. Maintain the Executive in Residence Program
4. Develop distant learning courses with international appeal
5. Fill the endowed chair position to expand the graduate program

**C. Actions and Time Period (Fiscal Years)**

- Add international event and content @ Symposium FY 2013-2014  
FY 2013-2014
- Attend Asian Racing Conference to promote FY 2013-FY2016
- Develop online content/classes
- Maintain Executive in Residence FY2013-FY2017
  
- Endowed chair search/hire FY2015-2016
- Measure Symposium progress and change accordingly FY2013-FY2014

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Training to prepare distant learning courses
- Contact foreign stakeholders to track needs
- Consider faculty with foreign racing expertise (Endowed chair?)
- Partial salary line for endowed chair

**E. Objective metrics that will be used to track progress towards attaining goal**

- Measure total Symposium attendance and international attendance
- Number of Executives in Residence
- Number of exchange students
- Number of people signed up for distant learning courses
- Endowed chair hired

**Notes (if any)**

**Currently we do not have the staff to service graduate students in the manner in which the program was designed. We currently only accept 2 or three applicants per year due to the ability with current resources to provide the needed experience. We have declined qualified applicants in some years.**

**STRATEGIC GOAL SEVEN: Expand current human health research, collaboration, and teaching in the area of microbiology**

**A. Current situation and gap between current situation and desired situation**

Several active faculty projects currently focus on pathogenesis of bacterial and parasitic human disease and related research. This is an area of study attractive to current and future students, and current class offerings dovetail nicely with the program. However, these could be expanded. Currently studied pathogens represent areas of importance for government funding agencies but Industry collaboration in this area remains relatively low.

**B. Strategy/ies to achieve goal (list if more than one)**

1. Increase course offerings in the area of human pathogens, medical microbiology, etc.
2. Strategic faculty hires
3. Increased collaboration with BIO5 and AHSC
4. Increased collaboration with industry partners

**C. Actions and Time Period (Fiscal Years)**

- Hire additional research and teaching faculty FY2013-FY2015
- Expand course offerings FY2014-FY2016
- Increase funding and extension through collaboration FY2014-FY2021

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Increased faculty
- Updated and expanded facilities

**E. Objective metrics that will be used to track progress towards attaining goal**

- Grant funding
- Number of faculty doing research with a human disease focus
- Enrollment in relevant courses housed in the department

**Notes (if any)**

**STRATEGIC GOAL EIGHT: Revitalize virology program**

**A. Current situation and gap between current situation and desired situation**

Current department faculty members have some virology experience but are not primarily focused on virology research at this time. Virology research at University of Arizona currently occurs in BIO5 and Plant Pathology but there is little to no outside funding for virology. Due to faculty retirement, human/animal Virology courses are not currently offered.

**B. Strategy/ies to achieve goal (list if more than one)**

1. Increase virology faculty
2. Offer previously existing and new virology course work
3. Increase graduate student research in Microbiology area of the new School of Animal and Comparative Biomedical Sciences

**C. Actions and Time Period (fiscal Years)**

- Strategic hire of faculty with existing research funding FY2013-FY2015
- Expansion of virology-based course work available FY2014-FY2015
- Continue seeking additional funding and possible industry collaboration FY2014-FY2021
- Continue to seek additional funding and industry collaboration FY2014-FY2021

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Facilities update/expansion

**E. Objective metrics that will be used to track progress towards attaining goal**

- Enrollment in virology course work
- Graduate research in virology
- Research funding
- Research publications

**Notes (if any)**



## **STRATEGIC GOAL NINE: Increase undergraduate enrollment and program diversity**

### **A. Current situation and gap between current situation and desired situation**

Recent website redesign at the University (degree search), college and departmental levels provide increased exposure and information for incoming students. Added to our other recruitment activities, undergraduate enrollment has increased over the past several years in all three majors: Animal Science, Veterinary Science, and Microbiology. We have excellent undergraduate scholarship opportunities and funding for both animal science and veterinary science. Advising of these undergraduate has been a challenge due to limited financial resources, and the advisor to student ratios have been maximized. With the new school and focus on biomedical sciences, we anticipate and strive to double our undergraduate enrollment. To do this, we will need more resources to hire advisors as well as increase course offerings/capacity, as many of the courses offered currently are at maximum capacity.

### **B. Strategy/ies to achieve goal (list if more than one)**

1. Increase faculty numbers through creation of a school and strategic hires
2. Expand undergraduate scholarship opportunities
3. Increase class offerings; whether it is by offering more or larger sections, or reorganizing some of these classes to be offered either partially or completely online
4. Add additional major option focusing on basic lab animal care/management
5. Reorganized and expand advising capacity
6. Take advantage of the lower tuition at University of Arizona relative to the University of California to attract students through more recruitment efforts in California

### **C. Actions and Time Period (Fiscal Years)**

- Strategic faculty hires for additional research and teaching and advising FY2013-FY2017
- Introduction of additional majors or options FY2015-FY2019
- Addition of course offerings for undergraduate programs FY2013-FY2016
- Continue to seek increased and new funding sources to support current and future students FY2012-FY2021

### **D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Increased graduate student teaching opportunities provided by addition undergraduate course offerings
- Increased funding and new funding sources
- Expanded program offerings

### **E. Objective metrics that will be used to track progress towards attaining goal**

- Student enrollment and retention/graduation rates in relevant majors
- TA/RA funding
- Scholarship awards

### **Notes (if any)**

**STRATEGIC GOAL TEN: Maintain and expand focus of core research, teaching, and extension programs in dairy, beef, and equine sciences**

**A. Current situation and gap between current situation and desired situation**

The facilities for beef feedlot research are outdated and need upgrades. There is no dairy research facility that allows for production level research – Plans are currently being developed for a facility that would work in conjunction with the completed ARC facility to meet this need. Experienced faculty, hired during the past two years, focus on both dairy and beef extension and will help these programs. Additionally, establishment of extension, teaching, and research programs in equine sciences focused on reproduction and nutrition have occurred. However, there is a lack of all livestock species on-site to provide for hands-on teaching experiences.

**B. Strategy/ies to achieve goal (list if more than one)**

1. Develop a plan for campus agriculture center that includes animal agriculture and increases teaching and extension capabilities through facility development and increased animal availability.
2. Maintain and develop closer ties with animal agriculture throughout the state.
3. Work with AMPHI High School Agriculture Program to develop hands-on experiences as well as mentoring between college and high school students.

**C. Actions and Time Period (Fiscal Years)**

- Develop a campus agriculture center master plan FY2012-FY2017
- Create and maintain strong relationships with dairy, beef, and equine industry partners FY2012-FY2021
- Execute campus agriculture center master plan FY2014-FY2021
- Fundraising for facility development FY2014-FY2021

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Administrative commitment to campus agriculture center master plan development and implementation
- Support from animal agriculture industries in the state to the plan
- Faculty leadership to follow through on the plan
- Commitment from campus agriculture center to the plan

**E. Objective metrics that will be used to track progress towards attaining goal**

- Development of master plan
- Facility development
- Animal numbers for teaching and extension programs
- Funds obtained to execute plan

**Notes (if any)**

**STRATEGIC GOAL ELEVEN: Direct teaching efforts to address lack of knowledge of production animal systems in a student population that comes from predominantly urban centers.**

**A. Current situation and gap between current situation and desired situation**

Students entering the animal science and veterinary science programs lack production animal agriculture experience because many come from urban areas. The lack of hands-on teaching opportunities resulting from inadequate animal numbers and facilities prevents students from acquiring the practical experiences needed to obtain a job in any production animal system. Furthermore, limited coursework on production animal systems is available due to faculty time limitations. Because of these deficiencies, a student-run club was formed, whose goal was to teach fundamentals of production agriculture from conception to the table. In theory, this was a good idea, but this club lacks the guidance of trained, experienced faculty, and students teaching students does not necessarily provide the right experiences. Our faculty wants to ensure that each and every student has a hands-on education in which not only are outcomes realized, but skill competencies as well.

**B. Strategy/ies to achieve goal (list if more than one)**

1. Develop animal sources and facilities to house agricultural animals that can be used to teach fundamental of production animal agriculture and encourage participation in clubs that provide opportunities for hands-on production training
2. Develop courses that focus on production animal agriculture

**C. Actions and Time Period (Fiscal Years)**

- Hire faculty FY2014-FY2017
- Develop production agriculture courses FY2014-FY2021
- Create facilities to teach animal production FY2014-FY2017
- Develop animal sources FY2014-FY2017
- Encourage membership in existing student let production agriculture clubs FY2013-FY2021

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Animals
- Faculty
- Facilities

**E. Objective metrics that will be used to track progress towards attaining goal**

- Job placement in production animal agriculture
- Retention and graduation rates of students

**Notes (if any)**

There is currently no adequate system to maintain contact with previous graduates to track their development in the animal sciences/production field.

## **STRATEGIC GOAL TWELVE: Reorganize Graduate Programs and Increase Graduate Student Base**

### **A. Current situation and gap between current situation and desired situation**

Graduate student applications and enrollment have steadily declined in both Animal Science and Microbiology, mainly due to lack of support funds for these students. As ERE increases, the existing graduate student funds have not stretched to cover as many students. Increased recruitment efforts are needed with emphasis on quality being paramount. In addition, having enough graduate student funding and enrollment are critical to the undergraduate teaching mission. As undergraduate enrollment increases, there will be a need for more TAs in the classroom helping faculty with classes. The Education Task Force has recommended that there be one graduate program in Animal and Comparative Biomedical Sciences with options in Animal Science, Microbiology and Pathobiology. This organization is to ensure that minimum numbers of graduate students at the Master's and Doctoral levels are met to satisfy ABOR requirements.

### **B. Strategy/ies to achieve goal (list if more than one)**

1. Increased recruitment of quality graduate students
2. Increased staff to focus on recruitment, retention, graduate tracking and advising
3. Increase TA/RA funding
4. Identify sources of new funds
5. Include graduate student salaries when applying for grants

### **C. Actions and Time Period (Fiscal Years)**

- Increased recruitment of graduate students FY2012-FY2021
- Increase staff to handle student retention, graduate tracking, and advising FY2012-FY2014
- Redefine the graduate program FY2013-FY2014
- Increase TA/RA funding FY2013-FY2015

### **D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Commitment from department/school and college
- Faculty leadership
- Faculty willingness to advise graduate students

### **E. Objective metrics that will be used to track progress towards attaining goal**

- Graduate Student numbers
- Retention rates
- Career placement
- TA/RA funding availability

**Notes (if any)**

**STRATEGIC GOAL THIRTEEN: Expand Extension Programs and Integrate Research to Meet Extension Needs**

**A. Current situation and gap between current situation and desired situation**

Extension programs are in a state of rebuilding after a period of little or no activity due to reduced availability of extension faculty. Currently the research and extension programs are not well integrated and there is need to improve the relationship between the college/school and the state animal agriculture industries. Animal science produces a quarterly newsletter that distributes to over 800 shareholders which may be one way to rebuild these relationships. The AzVDL also sends out updates to its 700 clients. The majority of large departmental research projects include extension components. While collaboration with agriculture extension facilities exists, it is limited. Industry collaboration is a missed opportunity that needs to be expanded tremendously, particularly in human, veterinary and food safety areas.

**B. Strategy/ies to achieve goal (list if more than one)**

1. Develop strong dairy, beef, equine, veterinary and other appropriate extension programs
2. Create a roadshow for extension/research programs – One current program is Cow College
3. Increase faculty presence at industry functions
4. Develop campus facilities to support on-campus extension activities
5. Reactivate the “Ranch to Rail” and “Reservation to Rail” programs
6. Increase collaboration with existing partners including CAS, Yuma cooperative extension facility and V bar V ranch
7. Improve veterinary diagnostic and extension by creating remote interface facilities such as at V-V ranch
8. Expand industry contacts
9. Increase faculty/staff/student/administration involvement in the community

**C. Actions and Time Period (Fiscal Years)**

- Provide support for equine extension FY2012-FY2021
- Support new dairy, beef and veterinary extension program development FY2012-FY2015
- Increase industry involvement in department/school FY2012-FY2021
- Assess current extension programs and opportunities FY2013-FY2014
- Add additional extension programs, particularly in human health and food safety divisions FY2014-FY2018
- Increase industry involvement in department/school FY2012-FY2021

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Additional money/staffing for equine extension at the department and college level
- Support for new faculty in dairy/beef extension
- Facilities to foster development of extension programs on campus and at remote sites
- Faculty involvement in extension pursuits
- Facilities to foster collaborative extension efforts
- Increased staff/faculty funding for extension projects

**E. Objective metrics that will be used to track progress towards attaining goal**

- Number of extension programs
- Campus agricultural center visitor numbers
- Industry funding
- Extension publications
- Grant funding for extension programs
- Faculty % time devoted to service

**Notes (if any)**

**STRATEGIC GOAL FOURTEEN: Establish a School of Veterinary Medicine [Note: this goal is no longer part of our Strategic Plan]**

**A. Current situation and gap between current situation and desired situation**

ABOR has approved funding (\$3 million) to study the feasibility of opening such a school at the Tucson campus of the University of Arizona, and we are awaiting the approval from the Governor and State Legislature. Arizona does not currently have a veterinary school and the WICHE program pays \$1.4 million in support for students to attend out of state schools. Veterinarians are needed in Arizona, particularly in rural areas and for large animals. The current major in veterinary science provides many students qualified and competitive for veterinary medical college and would be the base from which to select for this professional program.

**B. Strategy/ies to achieve goal (list if more than one)**

- Use funding, if provided, to investigate the feasibility of such a school, including facilities, faculty, etc.

**C. Actions and Time Period (Fiscal Years)**

- Acquire funding for studies on feasibility of veterinary school      FY2012-FY2013
- Assess requirements for new school and availability of resources      FY2013-FY2014

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Initially, an assessment of feasibility, needs and available resources. Additional inputs may then be decided.

**E. Objective metrics that will be used to track progress towards attaining goal**

- Funding for initial studies.
- Approval for the establishment of a School of Veterinary Medicine.

**Notes (if any)**

## **STRATEGIC GOAL FIFTEEN: Revise Undergraduate and Graduate Curriculum**

### **A. Current situation and gap between current situation and desired situation**

The undergraduate and graduate curriculum for all three majors is working well. However, there is a lack of stand-alone graduate level courses. Additionally, there are some areas of the undergraduate curriculum that has not been a focus due to loss of instructors. If the department is going to produce graduates with the knowledge and skills to be employable in the industry, course redesign is needed to make the majors more well-rounded.

### **B. Strategy/ies to achieve goal (list if more than one)**

1. Review course content and focal areas
2. Consider how best to include material that is missing from a well-rounded curriculum
3. As a group, evaluate what is necessary versus luxury
4. Consider current teaching assignments and how they may be maximized in the best possible way

### **C. Actions and Time Period (Fiscal Years)**

- Curricular review FY2013-2014
- Course modifications FY2013-2015
- If possible, faculty hires FY2014-2015

### **D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Curricular committee time to evaluate course material
- Course development
- Financial support to teach courses
- Availability of faculty to teach the necessary courses

### **E. Objective metrics that will be used to track progress towards attaining goal**

- Student enrollment
- Student retention
- Student graduation rates
- Student Credit Hours completed
- Career placement of graduates

**Notes (if any)**

# Department of Biosystems Engineering



## **Biosystems Engineering 2020-2025 STRATEGIC PLAN**

### *BE's Purpose:*

BE designs sustainable and data-informed solutions to generate food, bioenergy, and bioproducts; enhance human well-being; and optimize resources through innovative technologies and strategies.

### *BE's 2029 Vision:*

BE will be a world leader known for developing technologies and systems for the safe production of food, bioenergy, bioproducts, and biological information for sustainable use of resources in arid and semi-arid environments. Students, constituents, and professionals will come from across the world to participate with our programs.

### *BE's Mission:*

Our mission is to improve the quality of life through excellence in instruction, research, and extension. To achieve this, BE will provide safe and secure food, water, energy, and biological information systems to adapt to a changing world.

### *BE's Shared Values:*

#### *Innovation*

We are innovative in our solutions and how we approach engineering, life science, and data science practices to solve challenges important to society.

#### *Inclusiveness*

We bring different people, ideas, backgrounds, and perspectives together to produce lasting solutions for all. We encourage and help all to be successful.

#### *Interdisciplinary*

We embrace multidisciplinary collaboration to develop better solutions that address the needs of all.

#### *Cooperation*

We forge partnerships with academic, government, and industry colleagues to solve society's complex problems and improve the quality of life.

#### *Sustainability*

We manage use of natural resources to maintain healthy ecosystems throughout the production cycle of food, bioenergy, and bioproducts.

#### *Connectedness*

We work with industry and communities to understand tomorrow's needs and open up opportunities for our students and alumni to help.

#### *Ethics*

High ethical standards and sound decision-making are at the heart of our research, discovery, business, and financial practices.

## 2012 Strategic Goals

1. Facilitate the development of the sustainable **Bioenergy & Bioproducts Industry** in the Southwest U.S. by 2016 and become the “go-to” place for global development of arid land production of renewable biofuels and bioproducts.
2. **Biological Information and Sensors:** Become the center for development and analysis of information-rich applications in agriculture and life sciences.
3. Serve as a recognized worldwide leader in the development of innovative technologies and information systems for **production of safe food, feed, and fiber**.
4. The goal of the ABE **water resources engineering** area is to develop and provide world-class research, instruction, and Extension activity that improves economics, research utilization, and quality of life in semi-arid and arid regions which are being impacted by changing climate and changing demographics.

## The new BE Strategic Goals

(December 2017)

BE will

1. Prepare marketable individuals for careers in the next generation of Biosystems Engineering, Science, and Technology.
2. Have world-class infrastructure to be the go-to place for education, research, and extension.
3. Conduct and deliver strategically-critical, regionally-important, globally-relevant research to promote positive economic and social impacts in Arizona and the southwest region.

**STRATEGIC GOAL ONE:** Prepare marketable individuals for careers in the next generation of Biosystems Engineering, Science, and Technology

**A. Current situation and gap between current situation and desired situation**

The world has tremendous need for solutions to problems related to the environment, energy, health, food, water, and sustainability. Biological systems are related to or at the heart of all of these issues. A Biosystems Engineer learns to design and analyze biological systems to develop innovative and practical solutions.

Converting knowledge into action to solve real-world problems in the life sciences requires a merger of data science, biology and physics, and applied engineering (also known as the 4th Industrial Revolution). These efforts require innovative and integrated educational pathways in applied statistics, computer science, and engineering technology. The Biosystems Analytics & Technology (BAT) major trains students to take a true systems-level approach to understanding the relationships across food, water, and energy for a sustainable future by providing skills in sensors and remote sensing (data acquisition), statistics and bioinformatics (data management and analytics), and applying these tools to solve real-world problems.

**B. Strategies to achieve goal**

1. Continue to develop Biosystems Analytics & Technology major.
2. Provide educational and professional experiences for students and practicing professionals for workforce development.
3. Develop and strengthen communication channels with constituents, industry, and funding sources.
4. Engage under-served communities.
5. Secure more internship opportunities with funding, both intramural and extramural.
6. Require and encourage students to publish, make presentations, work on projects, develop intellectual property.
7. Secure industry-sponsored funding to support senior projects (both BE and BAT).
8. Foster soft skills for students (i.e., leadership, presentations in scientific meetings and conferences, team work, etc.).
9. Increase data literacy for all students.
10. Continue to investigate new degree programs in collaboration with other departments

**C. Actions**

**Time Period**

**(Fiscal Years)**

1) Foster stronger collaboration with colleagues on campus (CHEE, PLS, SNRE, AREC, NSC, and School of Information) in research, instruction, and extension.	FY 20-25
2) Work closely with private sector to expand internship availability.	FY 20-25
3) Develop on-line courses for students and professionals.	FY 20-25
4) Provide hands-on experiences for HS students through college in biosystems engineering & technology.	FY 20-25

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

1. Wider collaboration of faculty, staff, students, industry
2. Graduate assistantships (RA/TA) 5 @ \$25k each + ERE
3. Relationships with local HS, community colleges
4. Faculty lines for to replace faculty retiring
5. Collaboration w alumni

**E. Objective metrics that will be used to track progress towards attaining goal**

1. Number of students taking courses, students in the major, number of graduates, experiences on campus.
2. Number of internships offered.

3. Percentage of students offered jobs upon graduation.
4. *Will continue to develop at next retreat.*

**STRATEGIC GOAL TWO:** Have world-class infrastructure and resources to be the go-to place for education, research, and extension

**A. Current situation and gap between current situation and desired situation**

*Will be articulating this goal at the next departmental retreat.*

**B. Strategies to achieve goal**

1. Update and modernize BE facilities for research and education
2. Provide research experiences for students
3. Increase the number of online courses to reach a broader student base
4. Increase research expenditures for equipment and facilities, and diversify sources of funding
5. Increase collaborative efforts within UA, other institutions, and industry both nationally and internationally
6. Monetize services provided by the BE Fabrication Laboratory & Shop
7. Increase development activities (endowments, gifts, etc.) to support infrastructure
8. Promote research and teaching activities in off-campus centers (i.e., MAC, YAC)
9. Establish learning centers for workforce training in the use of digital tools for agricultural production
10. Explore monetizing innovative research outcomes/products with patents and licensing to generate revenue

**C. Actions  
Years)**

**Time Period (Fiscal**

Actions Years)	Time Period (Fiscal
1. Obtain funding to renovate Shantz 440	FY 19
2. Conduct a Rate Study for the BE Fabrication Lab & Shop to be able to charge for services	FY 20-21
3. Display current research posters in hallways, Shantz 440, 425, and on BE foyer monitor	

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

1. Willingness and participation of industrial partners with funding investments
2. Enhanced research and teaching facilities
3. Diversified funding and financial support for increased RA/TA's and technical staff FTE
4. Collaboration and support of UA OTT, Az Center for Innovation

**E. Objective metrics that will be used to track progress towards attaining goal**

1. *Will develop at next retreat*

**Notes (if any)**

**STRATEGIC GOAL THREE:** Conduct and deliver strategically-critical, regionally-important, and globally-relevant research to promote positive economic and social impacts in Arizona and the southwest region

**A. Current situation and gap between current situation and desired situation**

Currently, resources are strained to provide safe, secure, nutritious, and plentiful food, feed, and fiber supply to the world. This is particularly true in arid and semi-arid environments where resources needed for agricultural production (water, energy, infrastructure, labor) tend to be scarce. As world population increases and resources become increasingly limited, production systems that are more efficient, productive, environmentally sound, ensured safe, and economically viable will be increasingly important. Development and dissemination of new technologies and information systems that provide solutions to problems facing field and controlled environment agriculture (CEA) in arid and semi-arid environments is important today and critical for the future.

The BE department has long dealt with the problems associated with high temperatures and solar radiation loads, water scarcity, low soil fertility, and an increasing population. Many solutions include intensive crop production, specialized animal and crop breeding and germplasm evaluation programs, and an extensive dairy and meat production program, all of which are focused on climate-responsive sustainability. BE will continue to be the crucial interface between the laboratories and the field/controlled environment agriculture-based producers. In short, we are well positioned as a global leader in efforts to enhance agricultural production in increasingly harsh environments.

We live in an information-rich age in which measurements can be made on a tremendous number of aspects of living systems. It is becoming clear that having more information is not necessarily beneficial but requires thoughtful design and analysis. The BE department is unique in having faculty that span a wide range of areas in information-rich topics: fundamental biology, sensor development and deployment, biological statistics (biometry), and utilization of information for better decision making for optimal crop and animal production, human nutrition and health, and environmental protection. The BE department can play a leadership role in addressing issues that arise in application based information management and to bridge the gap between knowledge and insight especially in support of the private sector. Current thrusts include biosensors, plant health and growth monitoring, biometry, and remote sensing. Opportunities include genomics, bioenergy, biomedical, pharmaceuticals & nutraceuticals, monitoring & control of crop nutritional & phytochemical content, and natural products.

**B. Strategies to achieve goal**

1. Build agricultural production capacity that will, in time, sustain our collaborative efforts in arid land agriculture; combine the efforts of multi-disciplinary researchers and Extension agents working at existing centers within the college, in USDA, and with local farmers and growers. These include CEAC, MAC, YAC, ARC, Meat Science Laboratory, Water and Environmental Technology Center, WRRRC, and Food Safety Consortium; USDA facilities (ALARC, SWRC) and others; industries of cotton, leafy greens, greenhouse production, animal products, and others.
2. Develop and promote sensing, automation, and alternative energy systems for agricultural operations to reduce inputs (labor, water, fertilizer), while improving food quality, safety, and production primarily for semi-arid environments.
3. Support the growth and public perception of locally grown food and community agriculture through research, Extension, and instruction.
4. Develop internationally recognized education programs in arid land agriculture including CEA production, sensing and automation, and irrigation using marginal water and reclaimed water onsite wastewater treatment).
5. Assist growers, farmers, and the community through dynamic, timely, and unique extension programs.
6. Promote and facilitate international collaboration.
7. Develop tools for the detection of pathogens in the environment and in patient care.

8. Facilitate the ability to acquire and visualize, process, analyze, model and simulate complex data to close the data-to-knowledge gap

<b>C. Actions</b>	<b>Time Period (Fiscal Years)</b>
1) Formalize partnerships with colleagues to foster growth of arid land agriculture; jointly host visitors, local conferences, and coordinate research and teaching with the goal of solving high impact problems. Possibly create a Center for Translational Agriculture for Arid and Semi-Arid Climates (BE, PLS, AREC, ARC, ALARC, Nut Sci).	FY 20-25
2) Seek new sources of funding for research, extension, and instruction especially to promote utilization of new technology in arid land agriculture that utilizes integrated, strategic teams.	FY 20-25
3) Develop sensing, mechanization, and automation technologies for crop production in the field and in CEA environments to reduce labor requirements; decrease production cost; improve food safety, traceability, and nutrition; increase yields and improve resource use efficiencies with current production practices and with increasing use of marginal quality water for irrigation.	FY 20-25
4) Develop and evaluate information-rich methods (remote and near sensing, modeling and simulation, genomic and phenotypic data) using decision-support systems to improve agricultural production practice economics and environmental impact.	FY 20-25
5) Evaluate the “hard problems” in use of reclaimed water for irrigation.	FY 20-25
6) Translate new technologies and systems developed into viable commercial products with IP protection where appropriate.	FY 20-25
7) Facilitate community agriculture and education through Master Gardner programs, hosting externs, and community presentations.	FY 20-25
8) Develop educational tracks which partner with other CALS programs to foster incorporation of new technology into other majors (PLS, AnSci, AREC, AgEd, NS). Track with USAID initiatives.	FY 20-25
9) <i>Will continue to develop this section at next departmental retreat</i>	

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

1. Collaboration from diverse disciplines and organizations
2. Faculty-level planning and administration-coordinated efforts
3. Resources to perform technology translation
4. Financial support of unique facilities (CEAC, field capabilities)
5. Increase state and federally funded research and extension activities

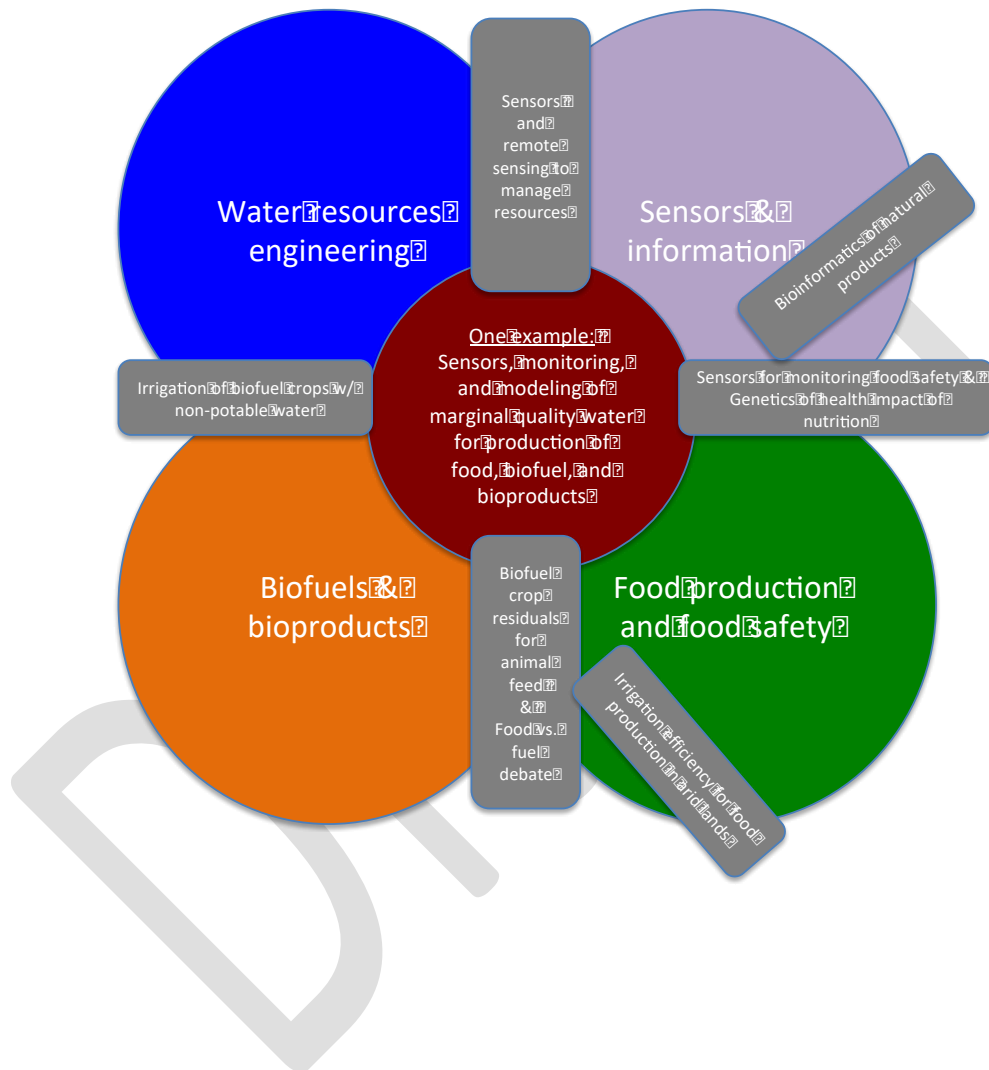
**E. Objective metrics that will be used to track progress towards attaining goal**

1. Number of technologies (IP protected and non-protected) developed that are commercialized.
2. Number of UA and non UA faculty, growers, and industry personnel participating in activities.
3. Number of graduates (BS, MS, PhD) who gain jobs in this field, especially in AZ.
4. External funds raised (sponsored research and Extension, industrial contracts, gifts).

**Notes (if any)**

**Notes:**

The strength of our activities is in developing and implementing technologies and systems for application with living systems. Our activities uniquely connect *across* areas, as demonstrated in the Venn diagram below in which our emphasis areas intersect. For example, we are developing sensors and devices to monitor safety of food; this clearly connects two of our topical areas. Many of our programs unite three or four of our goals. The connection of sensors, systems (and systems approaches), and devices is consistent across our activities and this technology-driven approach underlies all that we do.



# Department of Entomology



## **Entomology Strategic Plan Update 10-30-19**

**The strategies aligning with the UA Strategic Plan are listed below each goal.**

### **GOAL 1: Research**

#### **Strategies**

1. Target critical global issues with research led by our faculty & their collaborators
2. Retain current faculty who have outstanding research productivity
3. Recruit new faculty with outstanding research productivity
4. Increase research productivity of current faculty
5. Enhance collaborations in the Dept. and with others (UA, national & international)
6. Strengthen research infrastructure including support staff and facilities

### **GOAL 2: Integrated Pest Management (IPM)**

#### **Strategies**

1. Recruit & retain outstanding IPM faculty, appointed personnel & classified staff
2. Create a fertile environment for translational sciences needed to support IPM
3. Leverage resources from gifts/grants/contracts to support staffing needs (50% share of each)

### **GOAL 3: Undergraduate Engagement**

#### **Strategies**

1. Increase the percentage of undergraduate courses taught through active learning to 60% by FY2021 and 75% by FY2022
2. Increase faculty mentoring of undergraduate students in Entomology laboratories

### **GOAL 4: Entomology & Insect Science (EIS) Graduate Program**

#### **Strategies**

1. Increase support of RAs via increased faculty research grants
4. Solicit donors for endowments for student-invited speakership (Hagedorn) and student cash award to honor Genevieve Comeau (in progress)
5. Build support for first and second year students to apply for outside graduate fellowships (NSF, NIH, USDA)

### **GOAL 5: Outreach**

#### **Strategy**

1. Establish endowments for Insect Discovery and the Insect Festival

### **GOAL 6: University of Arizona Insect Collection**

#### **Strategy**

8. Obtain funding from grants and donations to support needed personnel

### **GOAL 7: Development**

3. Double the number of engaged alumni (e.g., service, advocacy, giving).
4. Increase alumni giving rate.

**ENTOMOLOGY 2019-2025 STRATEGIC PLAN**  
**October 30, 2019**

**Purpose**

Improve the quality of life of the people of Arizona and the world by generating, disseminating, and applying information about insects.

**2025 Vision (each component below is reflected in a specific strategic goal)**

1. The quality and impact of our research will be recognized in Arizona, nationally & globally.
2. Our IPM programs will be implemented in Arizona and other regions worldwide and will promote better health, protect the environment, and boost the economy.
3. We will engage undergraduate students with active-learning courses and mentoring to help them succeed in the fourth industrial revolution (4IR).
4. The graduate program in Entomology & Insect Science (EIS) will attract the best students; students completing EIS degrees will be in high demand by employers.
5. Our outreach programs will educate, delight, and connect community members with Entomology, CALS, and the University of Arizona.
6. The UA Insect Collection will be the best source of specimens from the Sonoran Desert Region and a global center for specimen-based insect research.
7. Our programs will be well supported by private donors, as well as by governmental agencies.

**Mission**

- Conduct outstanding research to better understand insects and their impact on humanity
- Provide distinguished education in insect biology
- Provide innovative solutions to address critical issues such as food security and vector-borne diseases
- Develop and deploy the most advanced technologies and progressive IPM programs in the world to minimize the negative impacts of insects and maximize their positive impacts
- Provide outstanding outreach programs about insects accessible to all community members

**Shared Values**

- Respect for all people
- Collaboration among department members
- Collaboration within & across disciplines with others in CALS, UA, and other institutions
- Put knowledge to work to improve lives
- Serve our profession and the people of Arizona and the world
- Excellence in all pursuits
- Passion for achieving positive outcomes
- Work hard and have fun doing what we love to do
- Provide value for resources invested in Entomology
- Develop programs with local and global relevance
- Take advantage of our desert environment & position in the front line of climate change

**1. RESEARCH STRATEGIC GOAL: Increase Entomology research productivity 30% by 2025.**

**A. Current situation and gap between current and desired situation**

Outstanding, cutting-edge research is our hallmark and the core strength that underlies excellence in our instruction, Extension and outreach. We aim to capitalize on this core strength to increase Entomology research productivity 30% by 2025. Our internationally recognized research must rise to meet the challenges of climate change and a rapidly increasing human population. These challenges demand innovative interdisciplinary research to lead the way in combating crop pests, biomedical pests, invasive species, and the decline in biodiversity.

**B. Strategies to achieve goal**

1. Target critical global issues with research led by our faculty and their collaborators
2. Retain current faculty who have outstanding research productivity
3. Recruit new faculty with outstanding research productivity
4. Increase research productivity of current faculty
5. Enhance collaborations in the Dept. and with others (UA, national, and international)
6. Strengthen research infrastructure including support staff and facilities

**C. Actions**

**Time Period (Fiscal Years)**

- Continue building interdisciplinary teams to address global challenges ..... 2020-25
- Reward faculty achievement with merit raises and promotions ..... 2020-25
- Nominate faculty for awards to recognize their outstanding achievements..... 2020-25
- Enhance mentoring of faculty by head and outstanding peers ..... 2020-25
- Encourage and reward productive team efforts ..... 2020-25
- Recruit faculty in areas with strong extramural funding prospects: mitigating... 2020-25 effects of climate change on biodiversity, pollinators, and food security; invasive species; insect genomics and bioinformatics; and insects of biomedical importance.
- Obtain more funding from international sources ..... 2020-25

**D. Inputs needed to achieve the goal**

- 6 tenure-track faculty lines (0.80 FTE research, 0.20 teaching): \$510K salary per year + ERE; startup of \$1.8M
- Research support staff: 12 FTE, \$480K salary per year + ERE
- Repair or replace shared research equipment: \$20K per year

**E. Objective metrics that will be used to track progress towards attaining goal**

- Extramural research funding per faculty research FTE per year
- Publications listed in Web of Science per faculty research FTE per year
- Citations per departmental publication in Web of Science
- Faculty honors and awards

**Note:** We expect 4-5 current tenure-track faculty will leave the department by 2024. Thus, filling the 6 requested faculty lines would slightly increase the number of tenure-track faculty.

**2. IPM STRATEGIC GOAL: By FY25, greatly enhance effectiveness of Integrated Pest Management (IPM) research, education, and Extension programs in Arizona for teaching students and stakeholders, and for addressing health, environmental, and economic problems caused by pests.**

**A. Current situation:**

- Cooperative Extension and research programs in IPM have garnered national and international recognition for their development and deployment of new strategies with large impacts on the economy, environmental protection, & society (e.g., > \$500 million saved since 1996 in Arizona alone).
- Key IPM faculty have left in the past decade (Dennehy, Byrne, Baker) and 2-4 of the remaining five Extension faculty are likely to leave by 2025.
- An internationally recognized graduate IDP in Entomology & Insect Science, with undergrads and graduate students actively engaged in fully integrated research/Extension programs giving them practical experience addressing real-world challenges.
- Capacity to create a premier U.S. center for IPM research, education, and Extension is incomplete, but would attract major funding, the best scientists, science, and students of IPM, and would generate solutions to society's pressing needs for safe and secure food, fiber, and healthy environments.

**Desired situation:**

- A world-class student-centered graduate and undergraduate IPM educational program (IDP) that capitalizes on the high profile research and Extension programs currently in place.
- Stable funding for students engaged in interdisciplinary problem-solving programs.
- An interdisciplinary synergistic approach that enables a fully collaborative environment across unit boundaries and enhances our effectiveness at winning major grants and having major impacts.
- Establish the UA as a premier center for IPM research, education, and Extension that impacts the future of the science and its application and implementation, and supplies the workforce needed to educate a generation of students that will face daunting food security, safety, and environmental challenges posed by pests and pest-related risks.

**Gaps:**

- New IPM teaching personnel are needed to develop the interdisciplinary curriculum that provides the third leg of our integrated research, education, and Extension IPM center.
- Investments have been made to establish cooperative teams including numerous units from within and external to CALS that work collaboratively with broad national networks, but the human assets employed to coordinate and link multiple groups across the state are funded solely by grants and contracts, thus program stability is constantly under threat.
- New IPM research and Extension personnel to fuel innovation in science and implementation.

**B. Strategies to achieve goal**

1. Recruit and retain outstanding faculty, other appointed personnel & classified staff in IPM.
2. Create a fertile environment for the development of translational sciences needed to support IPM.
3. Leverage resources from gifts/grants/contracts to support staffing needs (50% share of each).
4. Partner with allied colleges (e.g., Public Health, Pharmacy, Medicine, etc.), departments and units with similar interests to develop an IPM curriculum and to forge strong interdisciplinary relationships in research and Extension (Entomology (lead), Biosystems Engineering, Agricultural & Resource Economics, School of Natural Resources & the Environment, Plant Sciences,

Environmental Science, Experiment Station (MAC, YAC, SAC, CAC), County, and statewide Tribal Cooperative Extension Offices).

5. Develop courses (Gen Ed IPM, Advanced Topics in IPM, structural IPM, Medical & Veterinary IPM).
6. Establish new Extension IPM programs to meet stakeholder needs (e.g., Greenhouse, Small Farms, Commercial Horticultural IPM).
7. Establish stable funding for graduate student Extension assistantships & undergraduate research & Extension internships.

**C. Actions**

**Time Period (Fiscal Years)**

Secure 50% CALS/State funding of salary + ERE for highly productive appointed personnel who are now 100% grant funded .....	2021-25
Hire IPM faculty (80% research:20% teaching) & 1 research specialist .....	2021
Offer 100 level IPM Gen Ed course .....	2021
Offer specialized 400/500 level IPM courses (e.g., Biocontrol, Urban IPM).....	2022
Hire IPM faculty (80% Extension:20% teaching) & 1 research specialist.....	2022
Establish three IPM RA/TAships.....	2022
Hire IPM faculty (80% Extension:20% research) & 0.5 Extension educator .....	2023
Establish two IPM Extension Assistantships .....	2021
Hire IPM faculty (80% Extension:20% research) & 0.5 Assistant in Extension .....	2024

**D. Inputs needed to achieve the goal**

- Research/teaching faculty in IPM (2; \$170K salary per year + ERE)
- Classified staff (2 @ 3 years each; \$390K total)
- Graduate assistantships (2 RA/TAs; \$50K/yr)
- Cross unit agreements to mentor students
- Extension/research faculty in IPM (2; \$170K salary per year + ERE)
- Assistant/Associate in Extension (appointed, 4 @ 0.5 FTE; \$130K salary per yr + ERE)
- Extension assistantships (2 Ext. Asst.; \$50K/yr)
- Undergrad summer internships (2@ 0.5; \$4K/yr)
- One-time startup cost for 4 IPM faculty \$800K

**E. Objective metrics that will be used to track progress towards attaining goal**

- Number of IPM undergraduate and graduate students recruited to & graduated from IDP programs
- Number and amounts of grants awarded to IPM faculty
- Number and % of IPM graduates placed in career-track positions (near 100%)
- Number of professional continuing education units offered (CEUs) and delivered (No. of participants)
- Economic and social impacts of our IPM programs (\$ saved, pesticide use reductions)
- Increased security and safety of food and fiber supply produced in Arizona
- Number of peer-reviewed publications created each year
- Number of awards and honors received by IPM faculty
- Successful and continuing leverage of staff resources (classified staff > 3yrs; 2@0.5 Extension educators)
- Interest in and extramural support for fellowships, internships, assistantships, and endowments

**Notes**

The investment in human capital is a ca. \$500K per year with one time costs of another \$390K in staff support. Leveraged returns on this investment will easily be 3-fold & costs mostly offset by IDC returns to University [average annual grants (realistic, initially): \$250K/yr/faculty or \$1M/yr; average IDC rate %30 or \$300K/yr; (ideally and over time) \$3M/yr total with ca. \$1M/yr in IDC].

- Federal re-organization of IPM funding under a consolidated “Crop Protection” line of the USDA will increase visibility and funding for this vital program, and increase and standardize IDC to 30% equivalent to an effective rate of 42.65% of TDC (from previous 0–22% depending on sub-program).
- USDA’s National Institute for Food and Agriculture (NIFA) has created the Agriculture and Food Research Initiative (AFRI) competitive grants program that now rewards large, collaborative, team-based, and integrated (research, education, Extension) projects. Many awards are in the millions of dollars and at least 30% of funds from this program will be allocated to the Extension components. IPM, as a practical science that can fully articulate with Extension implementation programs, will have many new opportunities for funding through this program. A premiere IPM center for research, education, and Extension at UA would be ideally positioned to capture major resources from this program. Current IDC cap at 30% for this program, but many believe that future authorizations of this program will increase this cap in the future. [http://www.csrees.usda.gov/business/awards/indirect\\_cost.html](http://www.csrees.usda.gov/business/awards/indirect_cost.html)

**3. UNDERGRADUATE ENGAGEMENT STRATEGIC GOAL: Increase the yearly undergraduate student credit hours taught 30% by FY2025.**

**A. Current situation and gap between current situation and desired situation**

The Department of Entomology more than doubled the yearly undergraduate student credit hours (SCH) it teaches during the past decade, but would like to do more to provide students with a common foundation of competencies and skills to help them succeed in the 4IR. Accordingly, we aim to increase SCH taught 25% by FY2022. We have increased the number of undergraduate students mentored by faculty in our research labs, which strengthens the students' critical thinking skills, engages them in cutting edge research, and makes them more employable. Because of the exceptional benefits of this mentoring, we also seek to expand our impact in this area.

**B. Strategies to achieve goal**

1. Increase the percentage of undergraduate courses taught through active learning to 60% by FY2021 and 75% by FY2022.
2. Increase faculty mentoring of undergraduate students in Entomology laboratories
3. Implement a certificate program in Entomology
4. Develop a minor in Entomology

**C. Actions**

**Time Period (Fiscal Years)**

- Support faculty to incorporate active learning in their courses.....2020-25
- Appoint a departmental coordinator for undergraduate research..... 2020-21
- Revise certificate program proposal (if needed) after receiving UA feedback....2020-21
- Produce and submit proposal for minor in Entomology.....2020-21
- Reward faculty for undergraduate teaching and mentoring.....2020-25

**D. Inputs needed to achieve the goal**

- Faculty effort in incorporating active learning in their courses
- Faculty effort in mentoring students in their laboratories
- Approval by UA of the certificate proposal we submitted in 2016, with potential revisions by faculty to meet new guidelines, if needed

**E. Objective metrics that will be used to track progress towards attaining goal**

- Undergraduate SCH taught per academic year
- Percentage of undergraduate courses taught through active learning
- Number of undergraduate students mentored by faculty per year in Entomology laboratories
- Presentations by undergraduate students at scientific meetings
- Awards won by undergraduate students
- Journal articles coauthored by undergraduate students

#### **4. GRADUATE PROGRAM STRATEGIC GOAL: Double the stable funding for Entomology & Insect Science (EIS) graduate students by FY25.**

##### **A. Current situation and gap between current situation and desired situation**

The Graduate Interdisciplinary Program in Entomology & Insect Science (EIS) is nationally recognized as excellent and attracts outstanding students. In the past 15 years, 94% of students completing MS or PhD degrees in our graduate programs (EIS and its previously separate parent programs Entomology and Insect Science) obtained positions related to their graduate training. Enrollment in EIS has remained stable at ~30 students, with the largest single year intake (10) in AY19-20. Yet, funding for students is unpredictable, which threatens future recruiting and the long-term success of the program. Although faculty grants support some students, the largest single funding source now is via TAs for undergrad courses that we do not control (i.e., Introductory Biology courses in the College of Science). We are grateful for CALS support for GAs, but this has declined in the past few years from about 3 to 1 GA per year. In recent years, larger enrollment classes taught by our faculty have modestly increased our CALS funded TAs. To attain the desired situation of a standing enrollment of 30 or more fully funded EIS students, we aim to double funding from stable sources.

##### **B. Strategies to achieve goal**

1. Increase support of RAs via increased faculty research grants (see Research Goal)
2. Improve online interface with potential students and the general public
3. Build enrollment in frequently taught general education courses to earn TA support according to the CALS formula (each 60 students = 0.25 TA).
4. Solicit donors for endowments for student-invited speakership (Hagedorn) and student cash award to honor Genevieve Comeau (in progress)
5. Build support for first and second year students to apply for outside graduate fellowships (NSF, NIH, USDA)
6. Shift recruiting strategy to prioritize PhD over MS students to align with the new CALS first year funding formula providing 0.5 GA per 3-year rolling average number of first year PhD students (and none for MS students).

##### **C. Actions**

##### **Time Period (Fiscal Years)**

- Increase donor base and obtain donations for supporting students.....2020-25
- Develop the spring EIS seminar as a short research proposal writing seminar 2020-21
- Increase enrollment in frequently taught general education courses to earn TA support according to the CALS formula (each 60 students = 0.25 TA).....2020-25



#### **D. Inputs needed to achieve the goal**

- Faculty effort in increasing extramural grant funding with support for RAs
- Faculty effort in recruiting and mentoring EIS PhD students
- Efforts of department members and Advisory Board to develop donor base for student endowments: Attractive brochures, displays for Insect Festival, and websites
- Faculty teaching effort in large undergraduate courses
- CALS/UA increase in funding per year for GAs from current \$27K to \$66K
- CALS/UA support of TAs for 4 large undergrad courses, \$60K per year

#### **E. Objective metrics that will be used to track progress towards attaining goal**

- Funding of EIS students from faculty research grants, CALS RA and TA support and endowments
- Fully funded EIS students (total number and %)
- EIS degrees granted per year
- Increased proportion of EIS PhD students enrolled per year
- Papers published by EIS students
- Presentations by EIS students at scientific meetings
- Awards won by EIS students
- Job placement of EIS graduates
  
- **Note:** Core and joint Entomology faculty are the major advisors for nearly all EIS students.

**5. OUTREACH STRATEGIC GOAL: Double the number of people served each year by FY25 through sustainable outreach programs to meet public demand for insect information, to support K-12 science education, and to connect underserved communities to UA Entomology and CALS.**

**A. Current situation and gap between current situation and desired situation**

We deliver outreach via 3 main programs: Insect Discovery, the Arizona Insect Festival, and the UA Insect Collection (UAIC). Insect Discovery serves ca. 2,000 K-8 students yearly and teaches ca. 25 UA undergraduate and graduate students how to communicate science to the public. More than half of the students served are from low-income and minority communities. Since the first Arizona Insect Festival in 2011, this festival has grown to an annual event attracting over 3,000 visitors and involving more than 250 participants from within the university as well as the community. During the past year, associates of the UAIC delivered 25 presentations on insects to community groups and responded to 3,000 insect identification inquiries from the public. Despite the success of our current outreach programs, an enormous community demand remains for information about insects and for insect-related science enrichment for K-12 education. Moreover, these programs are supported largely by temporary extramural funding. To solve the problem of unstable funding and to capitalize on the opportunity to connect better with the community, we aim to obtain long-term funding and double the number of people served by Entomology outreach programs.

**B. Strategies to achieve goal**

1. Provide opportunities for graduate students to increase expertise in outreach through paid positions, courses, and seminars
2. Enhance communication statewide among all UA insect-related outreach activities
3. Increase awareness and participation in Entomology outreach activities in low income and minority communities.
4. Establish endowments for Insect Discovery and the Insect Festival
5. Train K-12 teachers how to use insects to teach science
6. Develop online insect outreach materials to reach beyond the local community

**C. Actions**

**Time Period (Fiscal Years)**

- Contact UA faculty statewide to coordinate insect-related outreach programs .....2020-21
- Catalog K-12 insect outreach resources online including links to programs .....2020-21
- Recruit more undergraduate students to Insect Discovery preceptor course .....2020-23
- Invite community organizations and businesses to sponsor the Insect Festival .....2020-24
- Collaborate with TenWest and other organizations to publicize the Insect Festival, with special focus on Spanish-language media.....2020-25
- Enhance UAIC and Insect Discovery websites.....2020-21
- Provide teacher training in using insects and insect collecting methods .....2020-25
- Develop a graduate course in communicating science and public outreach .....2021-22

**D. Inputs needed to achieve the goal**

- Funding for 2 new semesters of Outreach TAs per year (0.5 FTE) - \$32K per year
- Increased undergraduate volunteer involvement for course credit
- Faculty, student, and staff participation in annual Insect Festival
- Financial support for Insect Festival - \$20K per year until endowment is established

**E. Objective metrics that will be used to track progress towards attaining goals**

- Number of people served by Insect Discovery, Insect Festival, and UAIC
- Number of children in Title 1 and high minority enrollment schools participating in Insect Discovery.
- Number of visitors to the Arizona Insect Festival from zip codes in low-income, high minority neighborhoods
- Number and amounts of funded grants supporting outreach
- Number and amounts of donations supporting insect outreach as well as years of support (develop long-term sponsors)
- Number of insect-related K-12 programs statewide included in online outreach catalog
- Number of new collaborations among insect outreach programs
- Impact of Insect Discovery and other insect outreach programs on K-12 student learning based on teacher questionnaires

## **6. INSECT COLLECTION STRATEGIC GOAL: Make the University of Arizona's Insect Collection the world's best source of arthropod data and specimens from the Sonoran Desert Region, and a global center for insect research**

### **A. Current situation and gap to desired situation**

The 2 million specimens in the University of Arizona Insect Collection (UAIC) are a unique treasure for research, extension, education, and outreach focusing on biodiversity of the Sonoran Desert Region. Over the past six years we have: (1) moved the entire pinned collection into modern facilities, (2) improved visiting researcher facilities, (3) initiated an endowed visiting researcher program, (4) established a specimen-level database, Symbiota Collections of Arthropod Network (SCAN), which provides specimen-level data online via a Virtual Network linked to other arthropod collections around the world, (5) established a new lab within the footprint of the UAIC dedicated to extracting DNA from museum specimens, and (6) established an endowment designated to cover non-salary operating expenses for the collection.

We are well positioned to develop large-scale specimen-based projects related to biodiversity, pest management, invasive species, and/or the effects of climate change. Such projects will use the specimens in the UAIC to develop species occurrence maps and identification tools, including high-resolution images and species-specific DNA sequence data. In doing so, we will ultimately generate a new collection of total genomic DNA extracted from specimens curated in the UAIC. We will focus our initial efforts on two projects.

Project 1. Insects of Agricultural Importance in Arizona. We will network with UA Extension faculty and the USDA identifiers in Phoenix, Nogales, and Yuma to help us determine which species are of greatest concern to agriculture in Arizona and for which molecular-based identification tools would be most useful. [estimated 50 species and 1,000 specimens]

Project 2. Native Bees of the Sonoran Desert Region. With over 700 species of native bees, the Sonoran Desert Region is home to one of the highest diversities of bee species *in the world*. We need these important pollinators, and in many cases we don't even know their names. The UAIC maintains thousands of native bee specimens, representing 5 families, 65 genera, and approximately 520 species, many of which have been specialist-identified. The UAIC collection and the associated identification tools we are building will help researchers and conservationists to track and monitor the health of native bees of the Sonoran Desert Region. [estimated 520 species and 6,000 specimens]

These projects, and others like them, will position the UAIC as a leader in museum sciences, the Department as a global center for specimen-based insect research, and the University as a lead collaborator with other local education and agricultural institutions (USDA, Pima Community College, Arizona-Sonora Desert Museum).

## B. Strategies to achieve goal

1. We will expand the collection to include at least one specimen of every species in our two target groups (noted above).
2. We will enhance the UAIC by re-curating all specimens of the target species, following updated taxonomy. In the process, all specimen-level data, including georeferences, will be published in the SCAN database.
3. One specimen of every species in our target groups will be documented with high-resolution imagery. Total genomic DNA will be extracted from that specimen, archived in the collection, and aliquots of DNA will be made available to researchers upon request.
4. The barcode region of the mitochondrial gene COI will be PCR-amplified and sequenced for every target species. The DNA barcode will be published and made freely available to researchers, students, and the general public on the Barcode of Life Database (BOLD).
5. We will engage future scientists at the UA, Pima Community College, and Tucson Unified School District in the generation of DNA barcodes through course-based research experiences for undergraduates and high school students.
6. We will revive our established UAIC board of advisors to help guide transitions, connect with the larger community of systematists, and select annual Visiting Arthropod Systematists from applications.
7. Connect UA students, faculty, and staff with the local community of retired systematists and active amateur entomologists
8. Obtain funding from grants and donations to support needed personnel

## C. Actions

### Time Period (Fiscal Years)

- Specimen-level work as described above ..... 2020-21
- Update the UAIC website ..... 2020-21
- Expand the UAIC website to include these project descriptions and outputs ..... 2020-21
- Target systematists to apply for the Visiting Arthropod Systematist program ..... 2020-25
- Work with programmers to link SCAN and BOLD ..... 2020-21
- Enlist UAIC volunteers to help with UAIC projects ..... 2020-25
- Apply for funding to cover needed personnel ..... 2020-24

## D. Inputs needed to achieve the goals

- Project Coordinator or postdoc (\$50K per year), 1.0 FTE (via fundraising efforts, internal grants at UA, and external NSF-ADBC or NSF-CSBR grant (\$300K, proposal in prep).
- Graduate Research Assistantship for collection support (\$20K per year) 0.5 FTE. Hiring graduate students will allow us to attain our goals while simultaneously training the next generation of museum specialists.

## E. Objective metrics that will be used to track progress towards attaining goal

- Number of specimens re-curated, databased, published online.
- Number of UAIC specimen-related barcodes published online.

- Size of the UAIC Genomic collection and the number of loan requests received.
- Use of collection for local entomology meetings, sorting events by students, and outreach
- Number of research articles published using the UAIC.
- Amount of extramural resources obtained for projects.
- Number and scope of inter-institutional, regional, national, and international requests of UAIC and collaborations formed.

**7. DEVELOPMENT GOAL: Raise \$2M from private donors to support our programs by FY25.**

**A. Current situation and gap between current situation and desired situation**

The Department of Entomology fulfills UA's Land Grant mission by offering economically important research, extension and outreach to our state's stakeholders in agriculture, urban pest management, biodiversity conservation, and education. We are unique in UA and CALS because we focus on insects, which generate tremendous public interest. However, we receive little direct financial support from the public. We will connect with the community in new ways to increase stakeholders' financial support of Entomology & CALS.

**B. Strategies to achieve goal**

1. Increase visibility to stakeholders and all citizens of the state & region.
2. Connect with the community through events such as the Arizona Insect Festival, programs such as Insect Discovery, and resources such as the UA Insect Collection (UAIC).
3. Double the number of engaged alumni (e.g., service, advocacy, giving).
4. Increase alumni giving rate.
5. Maintain and enhance our high Department profile in local and national news.

**C. Actions**

**Time Period (Fiscal Years)**

- Work with the CALS Development Office to seek funding for our programs..... 2020-25 (Insect Discovery, EIS grad program, UAIC, Insect Festival, etc.).
- Invigorate the Department **Advisory Board** to connect with the community and be ... 2020-25 our advocates in diverse circles within the State (medicine, agriculture, pest management, etc.).
- **Renovate** the Entomology classroom (Forbes 412) and main business office..... 2020-22 (Forbes 410) to project a more modern image to visitors.
- Work with CALS to build **appealing exhibits** in the main lobby of Forbes, in the ..... 2020-25 Student Union, and elsewhere on campus to highlight the accomplishments and activities of the Department and other CALS Departments.
- Enhance the **department website** with development goals and ways for ..... 2020-21 stakeholders to become involved with departmental activities.
- Hold regularly scheduled support-raising events such as the Insect Festival, ..... 2020-25 insect-themed social events, and high-end events with invited supporters and potential new supporters.

**D. Inputs needed to achieve the goal**

- Effort by faculty and other Department members to support development
- Effort by Entomology Advisory Board
- Part-time Entomology Development Coordinator who will increase our profile, organize fund-raising events, and garner new resources: \$30K per year
- Collaboration from CALS Development Office
- Funds for physical renovations, exhibit development, and IT support: \$15K per year

**E. Objective metrics that will be used to track progress towards attaining goal**

- Funds raised per year

# Department of Environmental Science



ENVIRONMENTAL SCIENCE 2019-2025 STRATEGIC PLAN  
(10/27/19)

**ENVS Purpose:** Provide knowledge, skills, tools, and awareness pertaining to environmental quality and human-environment interactions in order to improve and sustain the function of environmental systems and protect human health.

**ENVS 2025 Vision:** Be a premier center for learning, research and outreach that finds solutions to diverse environmental challenges to improve the quality of all life.

**ENVS Mission:**

- Educate and train future generations to solve environmental issues at the intersection of biology, chemistry, physics and social sciences.
- Collaborate with industrial and professional partners to identify and apply practical and scientific solutions to current and emerging human - environmental challenges.
- Engage the community, including underserved populations, through extension services and citizen science.

**ENVS Shared Values:** Improvement of environmental quality and its relation to human health and well-being, and sustainable land and water management, as fostered through cutting-edge instruction, research, and service/extension/outreach activities of the Department.

**STRATEGIC GOAL ONE: Be recognized as the premiere unit in Environmental Science at the UA, nationally, and internationally.**

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

There is a significant emerging need to quantify and understand human-environment interactions at local to global scales in order to maintain environmental system function, and human health and well-being. Funding agencies recognize this need and increasingly support large inter- and trans- disciplinary research programs that span basic to applied, and research to education and extension program continua in order to address grand scientific and societal challenges in the areas of land, water and environmental quality and sustainability. Given our focus on land-water systems and interactions strongly impacted by human activity, ENVS has the expertise and experience to lead and/or collaborate on these types of projects.

**B. Strategy/ies to achieve goal (list if more than one)**

1. Maintain ENVS as a leader in UA-wide and multi-institutional, inter- and trans-disciplinary efforts that collectively span basic-applied-research-extension-education continua to address grand challenges in land, water and environmental quality and sustainability
2. Enhance research capacity and resource base by pursuing faculty development and funding opportunities at the intersection of environmental and human health
3. Expand ENVS activities in resolving and communicating the roles of climate and land-use change, increased urbanization, and energy production on water resources, agricultural soil and water management, food safety, and environmental remediation

**C. Actions**

1. Develop topical research centers
2. Hire faculty in targeted areas of research and extension
3. Curriculum development in environmental science
4. Translate to broader group of stakeholders ENVS activities and accomplishments

**D. Inputs needed to achieve the goal (not limited to financial inputs)**

- Physical infrastructure for housing large project personnel, students and collaborators
- Business office function that is enabled to facilitate multi-unit projects
- Extramural and State support for cutting-edge analytical and multi-user facilities
- State support for ENVS faculty replacements and hires
- Stakeholder in-reach on perceived research and extension needs

**E. Objective metrics that will be used to track progress towards attaining goal**

1. Number and size of large, inter- and cross-department grants
2. Publications, including for stakeholder outreach as well as in peer-reviewed journals
3. Student numbers and success
4. Departmental ranking in Environmental Science
5. Number of stakeholder events and interactions involving faculty

**Notes (if any)**

**STRATEGIC GOAL TWO: UA leader in the direction and provision of the Environmental Science and Sustainable Plant Systems B.S. degree programs.**

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

ENVS (as the Department of Soil, Water and Environmental Science) developed a rigorous, quantitative, and basic science based degree program in Environmental Science. ENVS needs to maintain and expand its role as the leader in the direction and provision of this program.

**B. Strategy/ies to achieve goal (list if more than one)**

1. Enhance pedagogy of a systems-level approach to environmental science
2. Translate efficiently new knowledge and tools into the curriculum
3. Provide a complement of foundational depth in parent disciplines with effective integration and applied coursework to provide an education that meets future societal demand for solutions to complex environmental problems
4. Provide outreach to and interact with Arizona high schools and community colleges for student recruitment and curriculum coordination

**C. Actions**

1. Pro-active engagement of allied units offering environmental science-related coursework (e.g., SEES departments, College of Public Health, etc.)
2. Advance the relevance and reach of the Environmental Science and Sustainable Plant Systems majors
3. Develop new courses that bridge the gap between introductory science coursework and more advanced coursework in the ENVS major
4. Update and assess student outcomes, goals, and achievements in a consistent way
5. Enhance student recruitment activities by developing effective linkages with and/or providing assistance to school districts across Arizona
6. Develop a new e-newsletter for the ENVS Department that will be sent to all students, staff, faculty, and alumni.

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Recognition via novel approaches to student credit hours of multi-unit participation in Environmental Science focal areas.
- Incorporate the wealth of UA-wide activities in environmental science into an exciting, cohesive and dynamic major for UA undergraduates that exposes them to the breadth and depth of the field (as it occurs at UA like nowhere else).

**E. Objective Metrics that will be used to track progress towards attaining goal**

1. Number of students enrolled in the ENVS degree program
2. Success of undergraduates following graduation
3. Quality of undergraduate performance

**Notes (if any)**

**STRATEGIC GOAL THREE: Direct robust and productive Environmental Science education program for the development of the next generation of professionals and leaders.**

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

ENVS undergraduate and graduate programs are focused mainly on serving traditional on campus students. There is a growing opportunity to provide continuing education and/or degree programs to working professionals seeking to enhance environmental science skills. ENVS is poised to address directly the needs of these non-traditional students through development of instructional programs to reach these students.

**B. Strategy/ies to achieve goal (list if more than one)**

1. Enhance outreach and enrollment of non-traditional students in ENVS programs
2. Enhance interdisciplinary research and education opportunities
3. Develop instructional structures to facilitate non-traditional student education
4. Increase teaching efficiency by focusing certain teaching efforts on online courses

**C. Actions**

1. Develop Accelerated MS program
2. Develop online degree options for ENVS B.S. and M.S. programs
3. Pursue microcampus initiatives for the ENVS and SPS degree programs

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- IT, faculty, and technical assistance for effective online course development (such a resource would be of benefit to units CALS-wide)
- Effective marketing and communication to non-traditional students of ENVS expertise and curricula
- Continued incentives to the Department for developing and offering online courses
- Scholarship support for non-traditional students

**E. Objective Metrics that will be used to track progress towards attaining goal**

1. Number and quality of students in ENVS degree programs
2. Number of non-traditional students
3. Number of online courses and enrollment
4. Measures of ENVS graduate success following graduation

**Notes (if any)**

**STRATEGIC GOAL FOUR: Develop novel funding mechanisms to support updated infrastructure, personnel, and programs.**

**A. Current situation** (i.e., problem to overcome/opportunity to capitalize on) **and gap between current situation and desired situation**

ENVS requires instructional faculty, startup funding, staff support, and updated infrastructure to achieve the vision and objectives discussed above. We have identified targeted programmatic areas in environmental science that have potential to be funded extramurally, while also supporting the UA's land grant mission. However, salaries and infrastructure require additional funding. Given the diminishing fraction of UA's budget provided by State funds, ENVS will pursue novel external means of support to facilitate development of these positions and infrastructure, meanwhile strengthening ties with local and national stakeholders.

**B. Strategy/ies to achieve goal** (list if more than one)

1. Develop new revenue streams for department from instructional programs.
2. Cultivate relationships with key stakeholders in Arizona and the nation who recognize the importance of ENVS activities in research, teaching and extension
3. Publicize the research, teaching and extension activities of ENVS to expand the base of departmental support

**C. Actions**

1. Identify new stakeholders served by ENVS programs
2. Develop enhanced public relations to publicize ENVS activities
3. Develop contacts and outreach to identified stakeholders
4. Involve ENVS alumni and friends in new department activities
5. Implement online ENVS degree programs
6. Develop microcampus programs in environmental science.
7. Develop a new e-newsletter for the ENVS Department that will be sent to all students, staff, faculty, and alumni.

**D. Inputs needed to achieve the goal** (do not limit to financial inputs)

- University and college level support ensuring endowment funds procured by ENVS and CALS directly support ENVS

**E. Objective Metrics that will be used to track progress towards attaining goal**

1. Number of endowed chair positions in ENVS
2. Amount of private funding donated to ENVS
3. Number of news and online articles written about ENVS activities and research
4. Number of stakeholders contacted for requests for potential support

**Notes (if any)**

Norton School of  
Family and Consumer  
Sciences

# **Norton School Strategic Plan**

<b>Table of Content</b>	<b>Pages</b>
<b>Norton School Level Plans</b>	<b>2-11</b>
<b>Division Level Plans</b>	
<b>Division of Family Studies and Human Development</b>	<b>12-16</b>
<b>Division of Retailing and Consumer Sciences</b>	<b>17-19</b>
<b>Appendix</b>	<b>20</b>

# Norton School of Family and Consumer Sciences

2019-2025

The Norton School's Purpose: to produce future executives and leaders in the professional field of family and consumer sciences, namely, executives in retailing/consumer businesses and human and health service sectors; to put research into practice in order to strengthen families, communities and the marketplace.

The Norton School's Vision: to become globally prominent in education and research in the field of family and consumer sciences; to produce the most highly prized graduates in the global economy; to become a magnet for public funding, private support, and collaborative research groups and research-based programs dedicated to solving problems that involve family systems, human health, and consumer sustainability.

The Norton School's Mission: to provide high-quality instruction and research, and also extension and outreach activities that will strengthen families, communities and the marketplace.

The Norton School's Shared Values: a diverse and inclusive community; excellence and integrity; innovation, partnership, and entrepreneurship; a collaborative ethos.

*Schools: please complete for each unit within the school as well as the school as a whole.*

1) Definitive statement about the difference you are trying to make in the world. You may have one purpose statement that encompasses all areas—your overall, as well as teaching, research and service purposes, or up to four purpose statements (describe each separately). Likewise, units within schools may have one or up to four purpose statements.

- To provide students with the best opportunities to achieve their career and professional goals and enhance their overall well-being.
- To find viable solutions to social problems facing families and consumers.

2) What will the outcome be once your unit's vision has been fulfilled?

- At least 25% of alumni (10+ years out) serving as successful executives, educators, and/or leaders in chosen field.
- 50% increase in annual expenditures (\$12M in FY21 from \$8.2M in FY12)
- internships and/or research positions available to all juniors
- The most B.S. degrees granted through online/distance programs (zero to N=150-200 by 2021)
- All centers/institutes 100% self-sufficient financially
- One or two new centers/initiatives launched and financially self-sufficient
- A 50% increase in the number of national faculty awards and student awards (currently 1-3 per year to 2-5 per year)
- 100 of full professors recognized through endowed positions
- 100% increase in endowments (\$50M by 2021)
- A central role for the CALS commerce and online initiatives
- A closer alignment with CALS21 priorities for research and extension (global commerce, the health sciences, informatics (big data) as well as environmental sciences related to water, energy, food consumption/food safety, and natural resources in solving societal grand challenges

4) What must be done to fulfill your unit's purpose?

- We must gain relief from the financial situation (3.3:1 to 2.5:1).
- We must achieve a better faculty-to-student ratio (currently 1:50 to 1:35).
- We must hire new faculty members with expertise (e.g., informatics, health science)



**NORTON GOAL ONE: Achieve global prominence in retailing undergraduate education; become the school best known for producing retailing and business leaders (through the unified efforts of the RCSC academic program, the Terry J. Lundgren Center, and the TCA Institute)**

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

1. Insufficient funding for teaching, experiential learning and advising
2. Insufficient number (about 18%) declaring RCSC as their pre-major among incoming freshmen.
3. Insufficient funding for the Terry Lundgren Center staffing
4. Insufficient teaching staff
5. Overly large classes (currently 45-60 for upper division courses; acceptable size: 40-45)
6. Small number of tenured/tenure-track faculty and ongoing faculty retention issues
7. Undergraduate students competitiveness as compared to business students on campus

**B. Strategy/ies to achieve goal (list if more than one)**

1. Create state-funded professor-of-practice positions to be responsible for providing excellent undergraduate learning experiences
2. Use professor-of-practice positions to provide more experiential learning opportunities
3. Raise endowment funds to support RCSC academics and Terry J. Lundgren Center operations
4. Increase the Center's partnership support
5. Recruit globally to acquire prominent retail firms as partners.
6. Involve young alumni in student-alumni network to aid student development
7. Offer competitive salaries to top-performing faculty members
8. Require FCSC 301 (Communication and Critical Thinking) as part of the undergraduate requirement.

**C. Actions**

1. Create state-funded professor-of-practice positions
2. Recruit top-notch incoming freshmen
3. Launch the endowment campaign in support of the Terry J. Lundgren Center
4. Provide more support for teaching and mentoring
5. Launch the Young Alumni Initiative
6. Track student internship and permanent placement record
7. Require FCSC 301 (Communication and Critical Thinking)

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

1. Existing faculty lines (when vacant)
2. Funding for teaching and advising
3. Funding for faculty salary adjustment
4. Integration of Division and Center faculties and collaboration between the two
5. Endowment earnings

**E. Objective metrics that will be used to track progress towards attaining goal**

1. Percentage of incoming freshmen declaring RCSC as a pre-major
2. GPA of students admitted to the major
3. Percentage of students receiving position offers prior to graduation
4. Number of top global retailing corporations serving on the TJL Center Corporate Advisory Board
5. Total amount of endowment in support of RCSC/TJL Center

**NORTON GOAL TWO: Provide nationally recognized family studies and human development undergraduate education measured in terms of students placed in professional (pre-med, pre-law, MSW) positions, top graduate schools (Ph.D) and the human services sector.**

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

1. Insufficient funding for teaching, experiential learning and advising
2. Insufficient number (about 10%) declaring FSHD as their pre-major during their first year of college
3. Insufficient funding for RAs and TAs
4. Overly large classes (currently 60-100 for upper division courses; acceptable: 50-60)

**B. Strategy/ies to achieve goal (list if more than one)**

1. Create state-funded professor-of-practice positions to be responsible for providing excellent undergraduate teaching and experiential learning experiences
2. Utilize tenure-track/research oriented positions for upper division courses and research experiences. Use professor-of-practice positions to provide more experiential learning opportunities
3. Raise the endowment funds to support FSHD academics and research experiences
4. Involve young alumni in student-alumni network to aid student development
5. Continue to invest in internship/research learning opportunities.
6. Require FCSC 301 (Communication and Critical Thinking) as part of the major.
7. Adjust teaching appointment levels of tenured faculty commensurate with administration / research productivity.
8. Adjust number of student credit hours / students taught / numbers of instructors to align with financial investment from CALS for undergraduate instruction.
9. Continue to raise private funds in support of programs.

**C. Actions**

1. Create state-funded professor-of-practice positions
2. Recruit top-notch incoming freshmen
3. Continue to seek private funds
4. Launch the Young Alumni Initiative
5. Track student placement record
6. Require FCSC 301 (Communication and Critical Thinking) as part of the major.

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

1. State funding for current instructional costs (from tenure vacant lines)
2. Funding for faculty salary adjustment
3. Endowment earnings
4. New faculty hiring

**E. Objective Metrics that will be used to track progress towards attaining goal**

1. Percentage of incoming freshmen declaring FSHD as a pre-major
2. GPA of students admitted to the major
3. Percentage of students receiving position offers prior to graduation
4. Total amount of endowment in support of FSHD academic and student development programs

**NORTON GOAL THREE: Achieve national and global prominence for the Ph.D. program in FCS with two concentrations**

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

FSHD concentration

1. GRE scores – V557 Q623
2. GPA – 3.58
3. Recent success in receiving NSF Graduate Fellowships – 3 in two years
4. Unsustainable funding model (too heavy on soft funding)
5. 100% placement (but mostly toward teaching oriented institutions)

RCSC concentration – Currently halted new admissions; planning for a minor program

**B. Strategy/ies to achieve goal (list if more than one)**

1. Restructure RCSC grad program and integrate it toward a single degree within the Norton School.  
Promote RCSC minor across campus to attract non-FCSC students to classes
2. Make the GRA/GTA stipends more competitive to be on par with campus
3. Train students to write grants and publish scholarly papers
4. Train students to apply for fellowships (e.g., NSF fellowships)
5. Provide research oriented faculty members with time to mentor graduate students.
6. Recruit top quality students
7. Continue to raise private funds for graduate fellowships.
8. Contribute to CALS21 goals – health sciences, environmental & consumer sciences related to food, energy, water, and natural/bio resources, informatics, and the role of consumers and families in solving societal grand challenges

**C. Actions**

1. Halt the new admissions for RCSC Ph.D. program
2. Restructure the RCSC Ph.D integrate with the FSHD program under one degree.
3. Offer competitive assistantships (using gift funds)
4. Offer high quality research/teaching experiences and summer fellowships
5. Develop an innovative recruitment strategy, one that matches core program goals, Faculty expertise, and faculty funding opportunities
6. Reduce the time-to-degree ratio – incorporate expectation into student annual review
7. Provide an interdisciplinary learning and research opportunity

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

1. More faculty discussion in both divisions
2. More endowment earnings
3. More faculty grants
4. Curriculum revision
5. Faculty reward system for mentoring graduate students
6. New faculty hires with necessary expertise for achieving CALS21 priorities

**E. Objective Metrics that will be used to track progress towards attaining goal**

1. GRE scores; GPA
2. Time-to-degree records
3. Student placement record; national awards (e.g., NSF fellowships)
4. Number enrolled in the FSHD option and RCSC minor and courses

**NORTON GOAL FOUR: Provide the most innovative, high quality, and locally relevant online degrees**

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

1. First cohort of Yuma Arizona Western College students (N=6) for FSHD
2. Recruitment of second cohort of Yuma Arizona Western College students (estimates N=15) for FSHD
3. First cohort of fashion minor (N=40+) with a wait list for RCSC
4. Insufficient support for teaching, advising, and field internship/practicum supervision/coordination

**B. Strategy/ies to achieve goal (list if more than one)**

1. Assess the current pilot program with a goal to determine its viability and effectiveness.
2. Offer a field practicum and internship programs
3. Expand program (offer a free-standing FCSC online degree program) with emphases in children, youth and families and consumers/entrepreneurship.
4. Identify collaborators for the FCSC online degree proposal
5. Seek private funding to support online degree programs and student scholarships.

**C. Actions**

1. Assess the current pilot program (FSHD AWC online & Fashion minor)
2. Offer a field practicum and internship programs
3. Develop capacity and stabilize online teaching staff
4. Identify collaborators for the FCSC online degree proposal
5. Expand (offer a free-standing FCSC online degree program)
6. Seek private funding in support of online teaching

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

1. Stabilized state funding for online teaching faculty members
2. Funding for student mentoring and advising
3. Administrative and financial support for the new FCSC online degree program

**E. Objective Metrics that will be used to track progress towards attaining goal**

1. The number of students enrolled
2. The number of degrees conferred annually
3. The number of students with internships and field experience
4. The number of online alumni who remain connected

**NORTON GOAL FIVE: Double funded research and outreach activities related to consumers, families, and communities**

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

1. Overly heavy teaching loads for grant-oriented faculty members
2. Insufficient rate at which the school is awarded grants
3. A significant disparity among the faculty with respect to the grant record
4. Very few funding opportunities in certain topic areas

**B. Strategy/ies to achieve goal (list if more than one)**

1. Move toward OneNorton research programs that will encourage more collaboration
2. Align research programs that are likely to be funded (CALNS21 priorities, NIH/NSF/USDA priorities, major foundation priorities)
3. Reallocate state salaries to support teaching and funded research programs
4. Use the annual performance review process to assess grant activities and reward high-achieving faculty members
5. Continue to strengthen the pre/post grant services infrastructure
6. Attract collaborators to the Institutes/Centers with respect to big grant ideas related to health and environmental science and CALNS21 priorities (food safety, natural resources, families/consumers in global commerce/bioscience)
7. Realign all endowment supports to faculty with achievements in grant-funded research.

**C. Actions**

1. Move toward OneNorton research programs that allow more collaboration
2. Allocate state salaries for funded research programs
3. Revise the Peer Review criteria to include a system for rewarding faculty grant activities
4. Continue to strengthen pre/post grant services infrastructure
5. Augment TCAI's funded research
6. Continue to raise private funds

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

1. Professor-of-practice positions that involve greater teaching responsibilities (creating release time for grant-funded research faculty)
2. Stabilized state funds to support faculty lines for teaching and research
3. Excellent business office support
4. A faculty willing to partner with collaborators outside its disciplines
5. New faculty hires that are aligned with CALNS21 priorities

**E. Objective Metrics that will be used to track progress towards attaining goal**

1. Amount of extramural grants obtained for research and outreach
2. Faculty productivity index, citations, publications, awards
3. Number of campus collaborators
4. Number of faculty affiliates associated with the Center/Institutes

**NORTON GOAL SIX: Continue to position Extension and outreach activities as a competitive advantage for funding and partnership building**

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

1. Insufficient number of extension specialists in the Norton School (currently two, one paid with soft funds)
2. Over-leveraged in terms of the ratio between specialists and agents
3. \$20M (past 10 years) – already high, and how can we double?

**B. Strategy/ies to achieve goal (list if more than one)**

1. Continue to invest in most highly funded area (health science)
2. Partner with other collaborators
3. Raise funds from private supporters (toward establishing a center/institute)
4. Hire new extension specialist in consumer science areas that are aligned with CALS21 priorities

**C. Actions**

1. Support the AZ REACH/integrative mental health programs
2. Meet with the UA Federal Relations personnel for a DoD contract possibility
3. Support the autism center proposal
4. Partner with other extension specialists (e.g., NSC)
5. Continue to raise private support to endow extension
6. Partner with and collaborate with institute/centers in and outside the Norton School
7. Hire a new extension specialist in consumer sciences area
8. Hire a new extension specialist in family studies area

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

1. Increase current number of faculty lines in extension
2. Private funding in support of AzREACH, early childhood, autism, consumer finance, and consumer sciences

**E. Objective Metrics that will be used to track progress towards attaining goal**

1. The total amount of grants
2. The total number of publications
3. The total number of people served
4. Economic impact (positions created by the grants)

**NORTON GOAL SEVEN: Become a major component of the CALS Global Commerce program**

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

- Insufficient focus (at the CALS level) on global commerce
- Insufficient collaboration with Ag Resource Economics
- Only one course related to food retailing offered by RCSC

**B. Strategy/ies to achieve goal (list if more than one)**

1. Participate in the Global Commerce track by offering one or more courses from RCSC.
2. Work with AREC and the CALS to recruit food retailers and suppliers that can assist in establishing the global commerce track.
3. Collaborate with CALS researchers to conduct consumer research in the area of global commerce
4. Offer joint FCS course(s) in families / human development (children, teens, parents, elderly) and the global economy (provided that funding follows).

**C. Actions**

1. Participate in the commerce career track by offering one or more courses
2. Work with AREC and the CALS to recruit food retailers and suppliers that can assist in establishing the global commerce track

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

1. CALS and AREC's efforts and commitment
2. More faculty teaching positions in the RCSC Division/Norton School

**E. Objective Metrics that will be used to track progress towards attaining goal**

1. The number of students enrolled in the Global Commerce track
2. The number of students enrolled in RCSC food retailing and other courses in the track
3. Amount of funding attracted

**NORTON GOAL EIGHT: Create the most effective Student Service Center on campus, one with a reputation of empowering students to become the nation's highest achievers with respect to their educational, personal, and career goals**

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

1. Currently centralized OneNorton Student Service Center
2. Measures to gauge the added value of advising (graduation rates, retention, time to degree, and time from declaring pre-major to admission to the major) are available; need to monitor
3. Assessment tool development in progress for the SSC effectiveness and outcomes
4. Too heavy reliance on soft funding (summer earnings) for student academic advising and student development (only .50 FTE advisor paid from state funding).

**B. Strategy/ies to achieve goal (list if more than one)**

1. Assist students to develop self-reliance and autonomy and shift advising efforts to student (individual or public) leadership and career development efforts
2. Communicate clear, consistent, comprehensive expectations at every step of a student's academic path
3. Identify and promote pathways to professionalism
4. Help student organizations to engage in networking, service and mentorship so as to strengthen leadership skills and promote initiative and professional development
5. Develop an effective advising, mentoring, and student development system for FCS online degree program
6. Utilize young alumni as resources for student development
7. Recruit top quality students

**C. Actions**

1. Provide tools and information that will help students to hone their decision making skills
2. Establish high standards and hold students accountable for their own learning and progression in the program
3. Continue to enhance the SSC website and technology use
4. Utilize social media effectively
5. Launch the Young Alumni Initiative project
6. Develop and implement method for assessing advising effectiveness
7. Develop and implement recruitment strategies for high achievers

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

1. Stable funding for advising staff lines
2. Technology assistance
3. Ongoing staff training
4. Support from division chairs and faculty members

**E. Objective Metrics that will be used to track progress towards attaining goal**

1. Level of student satisfaction with regard to advising and student development effectiveness
2. Student success in internship, career placement, and graduate/professional school placement
3. Number of admitted majors who have declared FSHD or RCSC as pre-majors as incoming freshmen
4. GPA of admitted majors



## **NORTON GOAL NINE: Increase endowments such that the school can become financially self-sufficient**

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

### **A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

1. Summer/outreach online revenues (currently at \$300,000-\$400,000 per year)
2. IDC (currently at: \$10,000 per year)
3. Endowment (currently at endowment: \$17M; pledged - \$15M)
  - a. current scholarship/fellowship endowment (e.g., Cowden, etc.): \$3M
  - b. endowed chairs/professorship: \$5M
  - c. TCAI: \$5M; FMI: \$1M; TJL: \$1.3M
  - d. Miscellaneous School endowment: \$2M
4. Pledges & bequests (currently at \$15M, including \$5M for TCAI)

### **B. Strategy/ies to achieve goal (list if more than one)**

1. Create and implement an enterprise model for all members of Norton School
2. Increase revenue opportunities through the online delivery of various instructional and outreach programs
3. Continue with the current school-wide endowment campaign
4. Build stronger alumni connections
5. Partner with private sector enterprises, non-public sector enterprises, and/or private foundations
6. Develop a human-capital infrastructure that can support funding and new opportunities

### **C. Actions**

1. Continue to invest in online model so long as funding follows
2. Develop multiple proposals for achieving endowment goals of TJL, TCAI, and FMI
3. Develop fundraising goals for Extension
2. Work with the Norton Advisory Board to achieve the Legacy Campaign goals
3. Continue to help the Young Alumni Initiative to achieve its long-term goals
4. Identify 300 potential donors and make personal contact

### **D. Inputs needed to achieve the goal (do not limit to financial inputs)**

1. School director's time and effort
2. Each institute/center director's/extension lab director's time and effort
3. Faculty buy-in, skills-building, and time and effort
4. Staff support
5. Social media/technology support

### **E. Objective Metrics that will be used to track progress towards attaining goal**

1. The total amount of funds raised
2. The total amount of online revenue generated
3. The total amount of grants received
4. The total number of alumni who donated to the school

# Division of Family Studies and Human Development (FSHD)

## FSHD STRATEGIC PLAN

The FSHD Division's Purpose: to generate, disseminate, and apply knowledge that contributes to the well-being of families, individuals of all ages, and the communities they live in.

The FSHD Division's Vision: to become the premier program in Family Studies and Human Development through timely and diverse research, teaching, and research-related outreach/Cooperative Extension.

The FSHD Division's Mission: to provide excellence in research, teaching, and outreach that strengthens families and human development across the lifespan.

The FSHD Division's Shared Values: [Same as Norton School Shared Values] a diverse and inclusive community; excellence and integrity; innovation, partnership, and entrepreneurship; a collaborative ethos.

- 1) Definitive statement about the difference you are trying to make in the world. You may have one purpose statement that encompasses all areas—your overall, as well as teaching, research and service purposes, or up to four purpose statements (describe each separately). Likewise, units within schools may have one or up to four purpose statements.
  - To offer students a high quality educational experience that provides them the best opportunities to achieve their career and professional goals.
  - To conduct cutting-edge research that leads to viable solutions to social problems and contributes to the well-being of families, communities, and individuals of all ages.
  - To apply research-based knowledge to improve the quality of life for children, youth, adults, and families.
  
- 2) What will the outcome be once your unit's vision has been fulfilled?
  - A high-quality, undergraduate program as evidenced by at least 25% of FSHD alumni (10+ years out) serving as successful leaders, researchers, educators, and/or practitioners in fields related to family studies and human development.
  - A top-notch, financially sustainable doctoral program as evidenced by student scholarly productivity, a strong record of FSHD student awards (e.g., NSF fellowships), and post-doctoral career success.
  - Recognized leader in providing high quality online/distance degree program in FSHD, as evidenced by B. S. degrees conferred and alumni career and professional success.
  - Internship and/or research experiences available to all FSHD majors both on-campus and in the distance degree program.
  - Frances McClelland Institute (FMI) 100% self-sufficient financially.
  - 50% increase in extramural grants for research/outreach projects.
  - All full professors recognized through endowments
  - A central role in the CALS online initiatives
  - A closer alignment with CALS21 priorities for research and outreach/extension (the health sciences, infomatics (big data), role of family science in solving societal grand challenges).
  
- 4) What must be done to fulfill your unit's purpose?
  - We must gain relief from the current financial constraints (annual expenditure : state allocation 3.3:1)
  - We must achieve a more manageable faculty-to-student ratio (currently about 1:45; acceptable 1:35).
  - We must offer competitive salaries and other incentives to retain high-performing faculty members.
  - We must hire new faculty members with expertise to meet CALS 21 priorities.

**FSHD GOAL ONE: Achieve national recognition for excellence in family studies and human development undergraduate education measured in terms of students placed in professional programs (Master's in Social Work, Marriage and Family Therapy/counseling, health professions, family law), top graduate schools (Ph.D), and leadership positions in the human services sector.**

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

5. Insufficient funding for teaching, experiential learning, and advising/mentoring
6. Unmanageable faculty to student ratio (currently about 1:45; peer institutions have ratios ranging from 1:15 to 1:20)
7. Small percentage (about 10%) of students declaring FSHD as their pre-major during their first year of college
8. Declining percentage of honors students in the FSHD major (drop from 11% in 2007 to 5.8% in 2009-10).
9. Insufficient funding for TAs
10. Overly large classes at upper division level (currently 60-100 for upper division courses; acceptable: 50-60 for writing emphasis courses, 60-80 for other upper division courses)

**B. Strategy/ies to achieve goal (list if more than one)**

1. Create professor-of-practice positions to be responsible for providing excellent undergraduate learning experiences.
2. Work with School Director to raise the endowment funds to support FSHD academics and research experiences
3. Involve young alumni in student-alumni network to aid student development
4. Continue to invest in internship/research learning opportunities for students.
5. Require FCSC 301 (Applying Critical Thinking to Discourse in FCS Organizations) or an equivalent course as part of the FSHD major in order to improve student critical thinking and communication skills needed for future professional success.
6. Adjust student credit hours/major and minor enrollments/number of instructors to align with financial investment from CALS for undergraduate instruction.

**C. Actions**

7. Create professor-of-practice positions
8. Recruit top-notch incoming freshmen
9. Launch the endowment campaign
10. Seek more support for teaching and mentoring
11. Launch the Young Alumni Initiative
12. Track student learning outcomes and placement records
13. Require FCSC 301 (or equivalent course) as part of the FSHD major.

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

5. Funding for teaching (professor-of-practice) and advising
6. Funding for TA's
7. Funding for faculty salary adjustment
8. Endowment earnings

**E. Objective Metrics that will be used to track progress towards attaining goal**

5. Percentage of incoming freshmen declaring FSHD as a pre-major
6. GPA of students admitted to the major
7. Percentage of honors students in the major
8. Percentage of students receiving position offers in FSHD-related field within one year of graduation
9. Percentage of students admitted to graduate/professional schools within one year of graduation.
10. Total amount of endowment in support of FSHD academic and student development programs

**FSHD GOAL TWO: Achieve national and international prominence for excellence in doctoral training in family studies and human development measured in terms of graduate student success in attaining professional positions in research, teaching, and/or research-based outreach/extension.**

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

6. Increased GPA and GRE scores for recent incoming graduate student cohorts (but funding uncertainties jeopardize ability to continue to successfully recruit top graduate students)
7. Increase in graduate student applications for grants and fellowships (need to continue this trend)
8. Increased success at obtaining graduate student grants/fellowships (i.e., 3 NSF Fellowships awarded in past two years) (need to increase the percentage of graduate students who are self-funded through grants/fellowships)
9. Recognized excellence in advanced statistics training (need to take steps to ensure that we can maintain this area of strength)
10. Strong record of graduate student scholarship (i.e., publications, conference presentations) (need to ensure continued strong faculty mentoring to support graduate student scholarship)
11. Unsustainable funding model (too heavy reliance on School funding)
12. 100% placement (but mostly toward teaching oriented institutions)

**B. Strategy/ies to achieve goal (list if more than one)**

9. Make the GRA/GTA stipends more competitive to be on par with campus
10. Continue to train students to write, present, and publish scholarly papers
11. Continue to train students to write grants and apply for fellowships (e.g., NSF fellowships)
12. Increase percentage of research assistantship funding coming from faculty grants and endowments
13. Provide faculty members with time to mentor graduate students.
14. Continue to recruit top quality students in numbers that are aligned with available faculty funding
15. Contribute to CALS21 goals – health sciences, infomatics, and the role of family science in solving societal great challenges

**C. Actions**

8. Offer competitive assistantships
9. Offer high quality research/teaching experiences and summer research fellowships
10. Develop and implement an effective graduate recruitment strategy that matches core program goals, faculty expertise, and is aligned with available faculty funding opportunities
11. Maintain acceptable time-to-degree ratio
12. Continue to provide interdisciplinary learning and research opportunities

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

7. More endowment earnings
8. More faculty members with grant funds
9. Faculty reward system for mentoring graduate students and administering the graduate program
10. New faculty hires with necessary expertise for achieving CALS21 priorities

**E. Objective Metrics that will be used to track progress towards attaining goal**

5. GRE scores; GPA
6. Time-to-degree records
7. Student placement records
8. Percentage of graduate students with grants and fellowships
9. Student scholarly productivity (i.e., publications, presentations)

**FSHD GOAL THREE: Offer a high quality, innovative, and locally relevant online curriculum and distance degree option in family studies and human development.**

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

5. 100% of FSHD required content courses available online (but could be enhanced by incorporating more innovative online technologies for course delivery)
6. All online courses taught by knowledgeable and well-trained lecturers and/or FSHD doctoral students (but sustainability jeopardized by financial uncertainties).
7. First cohort of Yuma Arizona Western College (AWC) students (N=6) completed first year in UA-Yuma pilot FSHD distance (2+2) degree program.
8. Recruitment of second cohort of AWC students (N=approx. 15) to begin distance degree program in AY 2012-13 (but insufficient funding to support growing teaching/advising needs).

**B. Strategy/ies to achieve goal (list if more than one)**

6. Enhance the current online curriculum through innovative use of technology
7. Assess the current UA-Yuma pilot program to determine its sustainability and effectiveness in promoting student learning outcomes
8. Offer field practicums and internship opportunities in Yuma
9. Explore expansion of the current FSHD distance program as part of future free-standing FCSC online degree
10. Identify potential collaborators for expanded FSHD distance degree

**C. Actions**

7. Incorporate innovative technologies into current online courses
8. Assess the current UA-Yuma pilot program
9. Offer a field practicum and internship program in Yuma
10. Develop capacity and stabilize online and Yuma-based teaching staff
11. Recruit and maintain UA-Yuma enrollments at about 20 students per year
12. Identify potential collaborators for expanded FSHD distance degree
13. Expand distance degree and align with FCSC online degree (if administrative and financial support available)

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

4. Stabilized state funding for online and Yuma-based teaching faculty members
5. Funding for student mentoring, advising, and internship support
6. Administrative and financial support for the expanded FSHD distance degree (as part of FCSC online degree program)

**E. Objective Metrics that will be used to track progress towards attaining goal**

5. The number of students enrolled
6. The number of degrees conferred annually
7. The number of students with internships and field experience
8. Percentage of distance degree students receiving position offers in FSHD-related field within one year of graduation
9. Percentage of distance degree students admitted to graduate/professional schools within one year of graduation.
10. The number of online alumni who remain connected

**FSHD GOAL FOUR:** Sustain a national and international reputation for excellence in research and research-based outreach on families and human development, and meet the school-wide goal to double funded research and extension/outreach activities through collaboration between the FSHD division, the Frances McClelland Institute (FMI), and Extension.

Please note that all goals must be specific, measurable, achievable, affordable, realistic, time-bound (i.e. you need to put a time by which you will achieve the goal in the statement). Limit to one page per goal.

**A. Current situation** (i.e., problem to overcome/opportunity to capitalize on) **and gap between current situation and desired situation**

5. Overly heavy teaching loads for grant-oriented faculty members
6. A “dedicated and productive” research faculty (but a significant disparity among the faculty with respect to grant activity and record)
7. Disparity in faculty motivations / skills to align research programs with funding opportunities
8. Cuts to federal research funds, coupled with fewer funding opportunities in certain topic areas

**B. Strategy/ies to achieve goal** (list if more than one)

8. Identify and participate in strategic research collaborations across FMI initiatives, TCAI, TJL, and Extension (consistent with OneNorton)
9. Re-allocate teaching and research assignments to release time for faculty with grant record based on criterion TBD (e.g., above bottom quartile for 5-year CALS faculty average grant total) while sustaining support for teaching.
10. Use the annual performance review process to assess grant activities and reward high-achieving faculty members
11. Continue to strengthen the pre/post grant services infrastructure
12. Attract collaborators with respect to big grant ideas related to health and environmental science and CALS21 priorities (e.g., families/consumers in global commerce/bioscience)
13. Realign endowment funding to support achievements in extramurally-funded research and extension / outreach

**C. Actions**

7. Strengthen existing and build strategic research collaboration across FSHD and RCSC divisions, Norton Centers and Institutes, and Extension
8. Re-allocate teaching and research assignments to release time for grant-active faculty members
9. Revise the Peer Review criteria to reward extramural funding
10. Continue to strengthen pre/post grant services infrastructure

**D. Inputs needed to achieve the goal** (do not limit to financial inputs)

6. Stabilized state funds to support faculty lines
7. Excellent business office support
8. Research faculty committed to obtaining extramural funding for their work and with the skills to do so
9. A research faculty willing to partner with collaborators outside its disciplines
10. New faculty hires that are aligned with CALS21 priorities

**E. Objective Metrics that will be used to track progress towards attaining goal**

5. Amount of extramural grants obtained for research and outreach (Goal: Double)
6. Faculty productivity index, citations, publications, awards (Goal: Increase)
7. Number of School / campus collaborators (Goal: Increase)
8. Number of faculty affiliates associated with the Center/Institutes (Goal: Double)
9. Number of grant-funded collaborative projects involving FSHD faculty and FMI faculty affiliates (Goal: Increase)

# **Retailing and Consumer Sciences**

## **(RCSC) STRATEGIC PLAN**

### **Purpose**

- To provide well-qualified graduates for the retailing industry and academia.
- To conduct and disseminate research on consumer behavior and decision-making that is both relevant to and funded by industry partners.

### **Vision**

- To be *the* program of choice for recruiting future retail leaders, as well as studying consumers and the business of retailing.

### **Mission**

- To provide world-class education on the business of retailing by integrating excellent instruction with cutting-edge consumer research.

### **Shared Values**

- A diverse and inclusive community of individuals who value and embody innovation and entrepreneurship within a collaborative academic environment.

### **What difference are we trying to make in the world?**

- To prepare undergraduate and graduate students for careers in the retailing industry and academia.
- To provide consumer insights relevant to industry partners.

### **What will the outcome be once our unit's vision has been fulfilled?**

- 100% B.S. majors have industry scholarships
- 100% B.S. majors have industry internship experience
- 100% B.S. majors have industry placement upon graduation
- 100% Ph.D. research assistantships are funded by TJLC research projects/grants
- 100% Ph.D. students have academic/industry placement upon graduation
- 25% alumni (10+ years out) are industry executives or tenured academics
- 100% faculty fractional research appointments are funded by TJLC research projects/grants
- 100% faculty research projects/grants highlighted in industry media/publications

### **What must be done to fulfill your unit's purpose?**

- High turnover among RCSC faculty must be addressed and resolved.
- RCSC undergraduate program must be sufficiently staffed.
- RCSC graduate program must be sufficiently funded.
- Terry J. Lundgren Center (TJLC) budget and operations must be strategically aligned with RCSC.
- RCSC faculty research must be aligned with interests of TJLC partners.

**RCSC GOAL ONE: Stabilize RCSC instructional and research faculty.**

**A. Current situation and gap between current situation and desired situation**

- Faculty turnover is high due to non-competitive compensation.
- Faculty is insufficient to support current instructional needs.
- Faculty instructional loads are increasing.
- Faculty research productivity is decreasing.

**B. Strategies to achieve goal**

- Use RCSC/TJLC endowments to retain high-potential faculty.
- Allow faculty to have differential fractional teaching and research appointments.
- Adjust and fund faculty fractional teaching appointments at market compensation.
- Allow faculty fractional research appointments to be funded by research projects/grants.

**C. Actions**

1. Identify high-potential faculty and use RCSC/TJLC endowments to retain them.
2. Restructure faculty appointments, compensation and performance criteria.

**D. Inputs needed to achieve the goal (financial and strategic inputs)**

1. Norton School Director
2. CALS/UA

**E. Objective metrics that will be used to track progress towards attaining goal**

- % faculty at market compensation (e.g., using AACSB salary survey)
- % faculty retained for 5 or more years
- % faculty fractional research appointments funded by research projects/grants



**RCSC GOAL TWO: Integrate RCSC and TJLC as one academic unit.**

**A. Current situation and gap between current situation and desired situation**

- RCSC and TJLC operate as separate units within the Norton School.
- RCSC faculty has no budgetary and strategic oversight of RCSC and TJLC operations.
- TJLC student development programs often uncoordinated with RCSC.
- TJLC has no research focus.
- RCSC faculty research is not explicitly aligned with interests of TJLC partners.
- RCSC graduate program admissions are halted due to lack of funding and faculty staffing.

**B. Strategies to achieve goal**

- Budget and operations of RCSC and TJLC are strategically aligned.
- TJLC and RCSC student development programs are strategically coordinated.
- RCSC faculty assists TJLC to develop a research focus.
- TJLC recruits industry partners interested in research consulting.

**C. Actions**

1. Begin operating as coordinated TJLC and RCSC organization (see attached structure).
2. Gain budgetary oversight of all RCSC and TJLC operations.
3. Develop model for an integrated RCSC + TJLC academic unit.
4. Gain partner strategic and financial commitment for integrated RCSC + TJLC academic unit.
5. Develop new strategic plan for integrated RCSC + TJLC academic unit.
6. Develop faculty/staff performance criteria for integrated RCSC + TJLC academic unit.
7. Secure ABOR approval and CALS/Norton funding for integrated RCSC + TJLC academic unit.
8. Begin operating as an integrated RCSC + TJLC academic unit.
9. Execute new strategic plan to meet 2021 outcome goals.

**D. Inputs needed to achieve the goal (financial and strategic inputs)**

1. Norton School Director
2. TJLC Industry Partners
3. CALS/UA/ABOR

**E. Objective metrics that will be used to track progress towards attaining goal**

- % B.S. majors have industry scholarships
- % B.S. majors have industry internship experience
- % B.S. majors have industry placement upon graduation
- % Ph.D. research assistantships are funded by TJLC research projects/grants
- % Ph.D. students have academic/industry placement upon graduation
- % alumni (10+ years out) are industry executives or tenured academics
- % faculty fractional research appointments are funded by TJLC research projects/grants
- % faculty research projects/grants highlighted in industry media/publications

# School of Natural Resources and the Environment

## **SCHOOL OF NATURAL RESOURCES AND THE ENVIRONMENT (SNRE): 2019-2025 STRATEGIC PLAN <sup>(1)</sup>**

**SNRE Purpose <sup>(2)</sup>:** To create the knowledge and the scientific workforce needed to deliver our natural resource base to the next generation in a better condition than it is today.

**SNRE 2025 Vision <sup>(3)</sup>:** SNRE is the University of Arizona's center-of-excellence for research, higher education and training, and extension and outreach for the conservation and management of natural resources and in the advancement of knowledge in public policy, planning, and human dimensions of natural resource management. SNRE is dedicated to improving our understanding and the sustainable use of natural systems and watersheds, wildlife and aquatic organisms, forests, and rangelands with a focus on arid and semi-arid lands.

**SNRE Mission <sup>(4)</sup>:** The mission of the School of Natural Resources and the Environment is to provide innovative and interdisciplinary research and applications that lead to sustainable management of the natural resources of Arizona, the West, and the Nation, and to educate existing practitioners and the next generation of resource managers, scientists and policy makers who will take on the challenge in an ever-changing world.

**SNRE Shared Values:** SNRE values conservation of the integrity and biodiversity of the ecosystems that make Arizona unique, while supporting the livelihoods of rural and urban Arizona.

## **STRATEGIC GOAL ONE: Maintain Domain Expertise**

### **A. Current situation and gap between current situation and desired situation**

Imminent retirements threaten our ability to provide training for the next generation of professional natural resource managers.

### **B. Strategy/ies to achieve goal**

One of our basic operating assumptions is that we will not be able to replace most faculty who retire. This will require that we maximize flexibility in how we can continue to provide critical instruction for our students. This will involve:

1. De-couple course responsibility from individual faculty members, to the degree this is possible to enhance flexibility to allow:
  - a. Team teaching using existing faculty
  - b. Recruitment of uniquely-qualified lecturers from the community
2. Make a case for replacement of faculty who are uniquely critical to our mission.

### **C. Actions**

First, we will identify specific needs that must be met to maintain our ability to train professionals who can be certified by professional societies in natural resources. Second, we will inventory the skills of our faculty and match them to our instructional needs. This will allow us to assemble a teaching team to offer the most critical courses. Third, we will identify professionals in Tucson (retired and active) who might be recruited to (a) offer entire courses, or (b) fill identified gaps in what our in-house teams might be able to provide.

### **D. Inputs needed to achieve the goal**

An internal and external inventory of internal professional expertise coupled with a matrix of instructional requirements and development of a business plan to support payment to local professionals when necessary.

### **E. Objective Metrics that will be used to track progress towards attaining goal**

Progress and success will be measured by the continued accreditation of our programs and the ability of our students to meet professional certification.

## **STRATEGIC GOAL TWO: Strengthen and Diversify Revenue Streams**

### **A. Current situation and gap between current situation and desired situation**

It is certain that state support will continue to decline. In the face of this decline, we must develop other revenue streams that are available to us. First, while SNRE has the largest graduate program in CALS, both our undergraduate program and our student credit hour production are modest. Second, we have very strong relationships with Federal and State land management agencies and conservation organizations. Research opportunities will be enhanced with the siting of the new Department of Interior Climate Science Center within SNRE. Third, our relationship with management and conservation agencies and our international prominence as a center for arid/semiarid land management offers unmatched opportunities for training career professionals. Pursuit of all three opportunities should enhance our funding situation.

### **B. Strategy/ies to achieve goal**

1. Increase student credit hours and number of undergraduates in our Natural Resources major
2. Increase revenues from sponsored research
3. Implement short courses
4. Participate in outreach college programs
5. Increase summer offerings

### **C. Actions**

Overall: We will establish an incentive system that will reward faculty members who contribute to each of the goals listed above (i.e., return some portion of the revenues generated through RCM, IDC, or professional training to actively involved faculty within the first year.

1. We will: (1) enhance our website to be more attractive and informative for prospective undergraduates (one year); (2) offer 2 more undergraduate (Tiers 1 and 2) classes to attract new majors (two years); (3) create Transfer Pathways (“2+2 programs”) to enhance movement of students from Arizona community colleges into the College and the Natural Resources major ( 1 year); and (4) actively participate in undergraduate orientation, job fair, and homecoming to enhance our visibility (two years).

2. The CSC will offer many new research opportunities with DOI agencies. We will actively pursue these with our partners (2 years). Work with CALS Research to streamline process of grant application and obtain assistance to build research teams.

3. We are assembling a survey of our state, Federal, and international partners to determine what types of professional training courses would be attractive. We expect to offer these within the next two years.

4. Work with outreach college/UA Online/UA Global to convert courses to the on-line environment and development of online degrees in GIS.

5. Recruit instructors for summer course offerings of courses that close with high enrollments and serve to slow student progress. Convert courses to on-line offerings for distance learning in summer.

### **D. Inputs needed to achieve the goal**

We are in the process of identifying our training needs (see B.3). We have space that we intend to modify for training that would include tables, chairs, and computers. We expect we will need \$30K to transform this space. We have several relatively new faculty who will be asked to focus more on generation of research funding, while other faculty will take on greater instruction and training duties.

### **E. Objective metrics that will be used to track progress towards attaining goal**

- Increased enrollments at the undergraduate (15%) and graduate (10%) levels
- Increased student credit-hour production (20%)
- Increased number of courses offered online (8 [currently 2])

- Increased value of research contracts and grants (20%)
- Increased annual revenue realized through professional training courses (\$40,000)

### **STRATEGIC GOAL THREE: Strengthen Relationships with Constituents**

#### **A. Current situation and gap between current situation and desired situation**

SNRE had an advisory board that was disbanded years ago. There is a very real need to reconnect with (1) the land managers (public and private) whom we serve for technical advice, (2) potential donors who might be willing to support the School, and (3) alumni, especially those willing to support our mission.

#### **B. Strategy/ies to achieve goal**

1. Reestablish an advisory board with members from (a) private land managers from Arizona, (2) Federal and state agencies we serve, and (3) non-governmental agencies.
2. Create a new development board that can work with developing support from private donors.
3. Create an alumni group for support of 1 and 2 above, and create a support system for our graduates.

#### **C. Actions**

1. Initiate contact with stakeholders.
2. Initiate contact with alumni and work with CALS Development to identify private donors.
3. Establish alumni board/group through contact with the UA Alumni Association and CALS Development.

#### **D. Inputs needed to achieve the goal**

The time, effort and commitment of SNRE Director, Associate Directors and Faculty.

#### **E. Objective Metrics that will be used to track progress towards attaining goal**

As above.

## **STRATEGIC GOAL FOUR: Enhancing Pre-Professional Experience and Employability of Students**

### **A. Current situation and gap between current situation and desired situation**

Many undergraduate students in SNRE participate in internships, independent study projects, and other pre-professional experiences, but we are not taking full advantage of opportunities for pre-professional experiences created by faculty research projects and our strong ties to management agencies. Also, no senior-level course in SNRE successfully serves as a capstone experience. A stronger program of pre-professional experiences will make our graduating seniors more employable by a variety of land management and conservation organizations.

### **B. Strategy/ies to achieve goal**

1. Enhance one or more existing senior-level course in SNRE, or create a new course, to provide a capstone experience to help prepare students for professions in natural resources science and management.
2. Work with agency and organization personnel (especially members of our new advisory boards) to find, create, and enhance pre-professional experiences within these agencies and organizations, and provide student mentoring by agency/organization personnel and SNRE faculty.
3. Create opportunities for students returning from internships and other pre-professional experiences to interact with each other and with School faculty.

### **C. Actions**

1. Work with SNRE Undergraduate Curriculum committee to design a new course or re-tool RNR 384
2. Add agency members to the Advisory Board, create job fairs and integrate agency/NGO/industry personnel in job fairs and courses.
3. Use social media, senior capstone and freshmen colloquium for students to share experiences.

# Department of Nutritional Sciences



## DEPARTMENT OF NUTRITIONAL SCIENCES 2019-2025 STRATEGIC PLAN

**Scott Going, PhD**  
Professor and Head

**Purpose:**

Advance knowledge of nutrition, food and exercise in the promotion of health and wellness.

**Vision:**

To discover, integrate, extend and apply knowledge of Nutritional Science and physical activity to promote optimal health and wellness and to prevent or treat disease.

**Mission:**

To provide outstanding research, graduate and undergraduate programs, and outreach education that advances nutrition and exercise in optimizing health and wellness for all people.

Graduates from our programs will be imbued with our values and will carry forward the unit's vision in their future endeavors.

**Shared Values:**

Integrity  
Excellence  
Mutual Respect in a Diverse and Inclusive Community  
Innovation and Entrepreneurial Action  
Partnerships and Interdisciplinary Collaboration

## TABLE OF CONTENTS

		<u>Page</u>
Strategic Goals 1	Fundraising	3
Strategic Goals 2-3	Undergraduate Program	4
Strategic Goals 4-6	Graduate Program	7
Strategic Goals 7	Professional Programs	10
Strategic Goals 8	Strategic Alliances	12
Strategic Goals 9	Infrastructure	14
Strategic Goals 10	Research	15
Strategic Goals 11	Extension	16

## **FUNDRAISING**

### **STRATEGIC GOAL ONE: Deepen the Department Financial Foundation**

#### **A. Current situation**

The Department needs to supplement revenue from instruction (which is stable, with good potential for growth) and sponsored projects (which is growing, yet volatile) with other sources of revenue and support. A multi-faceted development plan is needed.

#### **B. Strategies to achieve goal**

1. Develop a department branding and marketing strategy to support student recruitment and development plan.
2. Engage CALS Development Office in support of the development plan.
3. Enhance relationship with alumni and engage alumni in marketing and fundraising efforts.
4. Identify and engage industry partners.
5. Pursue revenue generating clinical and educational opportunities, e.g., clinical or fee for service outreach; distance education.

#### **C. Actions**

#### **Time Period (Fiscal Years)**

Convene Development Committee to create development plan.	ongoing
Monthly meeting with CALS Development Office.	ongoing
Identify potential industry partners and pursue partnerships.	FY20-ongoing
Make newsletter more alumni focused.	FY20-ongoing
Create Alumni Advisory Board.	FY20-21, ongoing
Identify and pursue donors; monthly donor visits.	ongoing

#### **D. Inputs**

- Faculty
- CALS Development Office
- Alumni involvement

#### **E. Objective Metrics**

- Explicit marketing and branding (written) strategy.
- Alumni participating on Advisory Board.
- Alumni financial contributions.
- Industry partners; sponsorships.
- Donors and support from Donors.

## **UNDERGRADUATE PROGRAMS**

**STRATEGIC GOAL TWO: Expand Access and Enhance Educational and Career Success of Undergraduate Students:** *Increase enrollment to 1000 students.*

### **A. Current situation**

Planned enrollment expansion will proceed with caution, balancing demand and resources. Pre-professional and health and wellness-focused students will be targeted to increase enrollments in the Nutrition option. A non-accredited flexible Nutrition option in NSC will allow greater student access to meet the demand of a popular undergraduate major. Dwindling (nationwide) dietetic internship opportunities necessitate alternative routes for students seeking nutrition education and careers.

In response, the Nutritional Sciences Didactic Program in Dietetics (DPD) faculty developed an accredited Individualized Supervised Practice Pathway (ISPP) to becoming a Registered Dietitian (RDN), with local and distance options. The program is thriving, despite logistical challenges, with significant potential for growth, given resources to sustain it.

In response to new ACEND (credentialing body) requirements for RDN's to have a Master's degree, we have created a new Professional Science Master's (PSM), enrolling 5-10 students per year, with strong potential for growth. An important outcome of the ISPP and PSM will be greater opportunity for our dietetics option majors to pursue the post-baccalaureate training required to achieve RDN, which supports future Nutritional Sciences (Dietetics) recruitment and enrollment.

To expand access and enhance career opportunity and success, we will develop innovative undergraduate curricula. We will emphasize skill development that underlies flexible career pathways, i.e., leadership, innovation, critical thinking and entrepreneurship. Our unifying mission is to provide outstanding education that advances nutrition and physical activity in optimizing health and wellness for all people. The development of new programs will be guided by achieving this mission.

### **B. Strategies to achieve goal**

1. Increase recruitment efforts of pre-professional students (pre-medicine, pre-pharmacy, pre-dental, PA, PT, nursing).
2. Increase department student body diversity.
3. Provide flexible learning modalities, such as online courses, modules, and certification programs aimed at serving more students and generating revenue.
4. Increase STEM majors in areas relevant to department mission (nutrition; food systems; wellness).
5. Expand fully online (AZ online) Nutritional Sciences (including Dietetics) degrees.
6. Increase diversity of undergraduate course offerings serving wellness-focused students and the greater university student population.
7. Expand winter and summer sessions offerings and associated enrollments, serving more students, speeding time to graduation, and generating revenue.
8. Provide focused academic and career advising to aid students (face—to-face and online) in determining appropriate route within the department's majors and education/career options post-graduation.
9. Provide increased opportunities for undergraduate mentoring, research and professional development.

### **C. Actions**

#### **Time Period (Fiscal Years)**

<b>C. Actions</b>	<b>Time Period (Fiscal Years)</b>
Actively recruit pre-professional students on and off campus, including at community colleges.	ongoing
Develop Multicultural Scholars Program Undergraduate Training Grants.	ongoing
Coordinate with Arizona community colleges to create 2+2 programs.	ongoing
Double AZ online enrollment.	FY20-FY22
Expand online course offerings.	ongoing
Create new courses: Food Systems, Precision Wellness, Fermentation Science, Culinary Medicine.	ongoing

Review and revise current undergraduate curriculum to reflect changes in professional department prerequisites, as well as changes in Dietetics accreditation standards. (Future Education Model)	FY20-FY22
Promote membership in UA student organizations, as well as professional organizations	FY20-FY30
Revise department undergraduate website for better marketing.	FY20-ongoing
Develop collaborations with the College of Applied Science and Technology for BAS degree.	FY20-22
Cultivate department alumni allegiance; create alumni community advisory board.	ongoing

**D. Inputs needed to achieve the goal**

- Faculty to develop and teach new courses
- Advisors
- Graduate assistants to support increased enrollment in current courses, as well as newly developed courses
- Technical and web-based support for online courses, revised undergraduate website, and social media
- Relationship with Career Services, on-campus collaborators, and off-campus interests
- Alumni and other community members engaged in student mentoring; fund raising.
- Funding for undergraduate research endeavors

**E. Objective metrics that will be used to track progress towards attaining goal**

- Number of recruitment events held; attendance at events, and number who enroll in department degree programs.
- Enrollment (majors) numbers by option and delivery method (face-to-face; online).
- Number of undergraduates engaged in conducting research.
- Enrollment in current courses (SCH).
- Number of new degrees.
- Number of new minors; areas of concentration (“track”).
- Number of new courses created and enrollment in new courses.
- Student placement into internships and professional programs.
- Revenue generated by winter, summer courses; courses through UA Online.

**UNDERGRADUATE PROGRAM**

**STRATEGIC GOAL THREE: Expand Access and Enhance Educational Success of Undergraduate Students:**

*Improve placement in viable post-graduate careers including dietetic internships, Food Systems related careers, allied health, and professional – graduate school by 50%.*

**A. Current situation and gap between current situation and desired situation**

Our placement rates for dietetic internships were below expectations and our post-graduate career data is incomplete. Due to recent efforts placement has increased significantly to 80% (above national average). Further improvement (to 90%) is desired. Better tracking of students beyond graduation remains an important objective.

**B. Strategies to achieve goal**

1. Expand Individualized Supervised Practice Pathway (ISPP).
2. Increase (double) number of clinical practice sites.
3. Develop Future Education (Dietetics) Model to comply with new accreditation requirements.
4. Enhance advising model to better direct the student toward success.
5. Improve access to information to connect students with extracurricular experiences and mentoring with faculty.
6. Perform Learning Outcomes Assessment on undergraduate courses to fine-tune course objectives towards skills necessary to compete.
7. Develop comprehensive plan to track students after graduation.

<b>C. Actions</b>	<b>Time Period (Fiscal Years)</b>
Sustain social media presence created to connect students with experience and job opportunities	FY20-ongoing
Post research and community program opportunities for undergraduate students	ongoing
Track student progress and placement via social media sites	ongoing
Develop Future Education Practice Model that is well articulated with undergraduate program	FY20-24; ongoing

**D. Input needed to achieve the goal**

Increased teaching faculty for teaching, mentoring, and coordination of dietetic internship.

**E. Objective Metrics that will be used to track progress towards attaining goal**

Student success numbers on post-graduation placement, including:

- dietetic internships
- professional schools
- jobs

## **GRADUATE PROGRAM**

**STRATEGIC GOAL FOUR: Expand Access and Enhance Educational Success of Students:** *Enhance graduate student recruitment.*

### **A. Current situation and gap between current situation and desired situation**

We aspire to an international reputation for training doctoral students in our signature areas who have the skills (content expertise, strong research methods, and “soft” skills) needed for independent inquiry and to become contributing members of interdisciplinary teams. Despite excellent academic and research programs the quantity and quality of the graduate applicant pool has declined in part because graduate faculty numbers declined. An active recruitment (“marketing”) plan is needed. In the highly competitive research grant environment, joint appointed (graduate faculty) faculty are under considerable pressure to only advise and fund home department students, limiting placement of graduate students and our capacity to expand. Incentives for faculty and greater graduate student support is needed.

### **B. Strategies to achieve goal**

1. Develop marketing plan, and marketing materials.
2. Develop funding for marketing and recruitment.
3. Update website – enhance appeal for graduate student “market”
4. Strategic research faculty hires
5. Increase number of graduate faculty (e.g., joint appointments)
6. Develop new graduate degree relevant to strategic aims.

### **C. Actions**

#### **Time Period (Fiscal Years)**

	<b>Time Period (Fiscal Years)</b>
Convene working group to develop a marketing plan	FY20-21
Revise website content showcasing graduate program	FY20-21
Showcase former graduate students by job sector on website	ongoing
Working with a graphics designer, develop effective electronic brochures	FY20-21
Implement marketing plan	FY20-ongoing
Survey applicants who declined offers to provide areas of improvement	Ongoing
Convene graduate curriculum working group to develop graduate focus in Precision Wellness	FY20-21

### **D. Inputs needed to achieve the goal**

- Engage current and former students
- Department IT staff
- Marketing specialist; graphics designer
- Feedback from undergraduate research groups (UBRP, MARC, McNair, etc)
- Feedback from applicants who declined offers
- Funding for campus visits by top candidates
- Funding for graduate students

### **E. Objective metrics that will be used to track progress towards attaining goal**

- Number applicants to graduate program
- Number of quality applicants as assessed by admissions committee
- Number of visits to graduate program webpage
- Number of out-of-state applicants; number of international students.
- Admissions
- Funding for graduate students

## **GRADUATE PROGRAM**

**STRATEGIC GOAL FIVE: Expand Access and Enhance Educational Success of Students:** *Double graduate student funding by 2025*

**A. Current situation gap between current situation and desired situation**

Our funds for graduate training have been dependent on University and College money for Graduate Assistants (which has dwindled) and research faculty grants. As resources dwindle, it is essential to find other sources of revenue to support our student’s training.

**B. Strategies to achieve goal**

1. Utilize training grant opportunities (NIH, USDA) to fund students
2. Develop an alternative funding model that does not rely on federal grants (e.g., industry partners)
3. Require PhD students to submit a fellowship grant
4. Faculty hires with external funding to support graduate students.

**C. Actions**

**Time Period (Fiscal Years)**

Renew the USDA/NIFA National Needs Fellows training grant	FY23-ongoing
Convene working group to develop and submit a pre-doctoral training grant in signature areas: cancer biology; precision nutrition	FY20-21; ongoing
Mentor PhD students on successful Fellowship grant applications	ongoing
Develop and implement a new funding model action plan for our graduate assistantships (e.g., industry sponsors of graduate students; donors of “Endowed” assistantships)	ongoing
Establish/Engage Alumni Advisory Board to assist with fundraising initiative	ongoing
Develop department funds for graduate student bridge support	ongoing

**D. Inputs needed to achieve the goal**

- Faculty, students, and Alumni
- Program directors from federal funding agencies
- List of alumni by job sector
- CALS Development Office

**E. Objective Metrics that will be used to track progress towards attaining goal**

- Training grants submitted and awards received; number of students supported by training grants.
- Number of pre-doctoral fellowships submitted by graduate students; awards received.
- Number of faculty involved in the mentoring of training grant trainees.
- Number of contact hours with potential donors; donors.
- Sponsorship of students by industry and other donors.
- Number of alumni engaged in fundraising.
- Funding for graduate training.

**GRADUATE PROGRAM**

**STRATEGIC GOAL SIX:** Expand Access and Enhance Educational Success of Students: *Enhance mentoring for graduate students*

**A. Current situation and gap between current situation and desired situation:**

The Nutritional Sciences Graduate Program (NSGP) does not currently have input from outside resources related to the success and assessment of the program. An external advisory board could fill the need by providing useful feedback related to our educational objectives, curriculum development, student preparation for the work force, placement of graduates after completion of their degree and assessment goals of the program. An external advisory board can provide perspective, support and advice to the NSGP that is current, up-to-date and relevant to professional practice. They could assist in the development of new curriculum and program initiatives, assessment of the labor market and identifying strategies to advance the NSGP at the local, state, national and international level. Their active participation along with strong internal mentoring from the NSGP faculty can provide outstanding opportunities for our students.



**B. Strategies to achieve goal:**

1. Identify and recruit successful, influential Alumni and other Stakeholders with desired credentials for service on an Advisory Board for Career Development.
2. Optimize student success during graduate education

**C. Actions**

**Time Period (Fiscal)**

Determine selection criteria and develop a list of prospective board members	FY20-21
Develop operating guidelines for the advisory board	FY20-21
Recruit advisory board members.	FY21-22
Convene Advisory Board; The Advisory Board will select a Chair from the board members.	FY22
Invite advisory board members to present a seminar.	FY21-ongoing
The Advisory Board will meet on a regular basis and document its work	FY22-ongoing
update Joint Appointed Faculty listed	yearly
Meet with outgoing students	yearly

**D. Inputs needed to achieve the goal:**

- Faculty (Graduate Research Degrees Committee) time for planning
- Advisory committee members
- Resources for planning meeting; materials; conference calls
- Travel costs
- Incentives (monetary, other) for Advisory Board service

**E. Objective metrics that will be used to track progress towards attaining goal:**

- Number of seminars given by Advisory Board members
- Advisory Board members and participation; types of input for Advisory Board members
- Programmatic revisions arising from Advisory Board input
- Mentoring opportunities afforded students by Advisory Board members through their contacts
- Placement of graduate students upon graduation
- Results of graduate student exit surveys
- Statistics on graduate program including time to degree, number of degrees awarded
- 5 and 10 year post-graduate survey

**NOTES:**

**PROFESSIONAL PROGRAMS**

**STRATEGIC GOAL SEVEN: Expand Access and Enhance Educational (and Professional) Success of Undergraduate and Graduate Students:** *Develop Future Education Practice Model; increase number of successful applicants to supervised practice programs; increase enrollment in Professional Programs (PSM; GCAN)*

**A. Current situation and gap between current situation and desired situation:**

The demand for nutrition professionals is projected to increase through the year 2020 (Hooker et al *J Acad Nutr Diet* 2012 Suppl 1; 112(3): S75). To help meet this demand, the Department of Nutritional Sciences currently offers a Didactic Program in Dietetics (DPD), a pre-professional undergraduate program that prepares students to apply for professional dietetic internships (DI's). DI's are nationally accredited professional training programs, requiring 1,200+ supervised hours, the majority of which take place in a clinical (i.e. hospital) setting. Successful completion of a DI allows graduates to become accredited nutrition professionals - Registered Dietitians. The number of professional DI's nationally has shrunk, leading to lower placement rate in DI's. In response, we have created an alternative pathway, the Individualized Supervised Practice Pathway (ISPP), to improve placement rates and career success for our students. Local and distance opportunities exist. In response to new ACEND (accrediting body) requirement for a Master's degree by 2024, we have also created a Professional Science Master's (PSM) degree. A Graduate Certificate in Applied Nutrition (GCAN) was created for non-nutrition professionals. Enrollment in these programs has been good; significant potential for growth exists, if adequate resources to support the programs are available. Changing accreditation requirements will necessitate better integration of our ISPP and PSM to create what the accrediting body (ACEND) calls the Future Education Model.

**B. Strategies to achieve goal**

1. Expand options for post-graduate internship programs at UA, adding options such as *Community Nutrition & Regional Food Systems*, in addition to the traditional focus on clinical dietetics.
2. Over a 5-year period, 75% of DPD graduates will apply to supervised practice programs the academic year they complete the DPD program; over 90% of those applying will be accepted.
3. Develop Future Education Model (FEM)
4. Double enrollment in ISPP
5. Double enrollment in PSM

**C. Actions**

**Time Period (Fiscal)**

Convene a FEM committee comprised of NSC faculty and staff	FY19-ongoing
Determine FEM program structure & finances (approximately ≥ \$10,000 tuition fee per student)	FY2020-21
Determine FEM program characteristics (program mission, goals, outcomes, assessment, improvement)	FY20
Develop FEM (ISPP, PSM) curriculum (learning activities, program concentrations, curriculum length, learning assessment, ongoing curricular improvement)	FY20-22
Identify FEM Program Managers and develop Management Plan (qualifications of program director, responsibilities, program resources, faculty, preceptors, continuing professional development, supervised practice facilities, program information, policies and procedures, program handbook)	FY20-ongoing
Expand enrollment to 15 interns annually (~10 from UA program and ~5 from other regions), generating \$10,000 x 10 = \$100,000 annually in program revenue	FY2023-ongoing

**D. Inputs needed to achieve the goal:**

- 1.0 FTE Program Director (Registered Dietitian with MS or higher in Nutrition)
- 0.50 FTE Program Coordinator (Registered Dietitian with MS or higher in Nutrition)
- Faculty Mentors (NSC, Public Health, Extension)
- Community preceptors

**E. Objective metrics that will be used to track progress towards attaining goal:**

1. Number of sites and strategic partners who will serve as preceptors for ISPP interns.
2. Professional internship application rate and acceptance rate.
3. Number (and type) of career placements of DPD students and ISPP graduates.

4. Revenue generated by UA ISPP program.

**Notes:** The dietetics profession is changing, and to remain at the forefront of the health and nutrition profession, our students must be adequately prepared to take on new public priorities as they arise (health care reform; precision nutrition, food security), deal with changes in the population (an increasingly diverse and aging population), and take advantage of advances in science and technology (health informatics, personalized medicine, mobile health), all of which influence how people live, learn and work. Successful graduates and professionals will be able to respond to these changes by applying a core set of skills and competencies to any nutrition-related issue. In addition to integrating these concepts into coursework, the UA Department of Nutritional Sciences should offer a NEW opportunity for post-graduate student training – a professional internship program for nutrition students (e.g., Individualized Supervised Practice Pathway), along with the Professional Science Masters, integrated into the Future Education Model now promoted by the accrediting body, ACEND.

## **STRATEGIC ALLIANCES**

**STRATEGIC GOAL EIGHT: Strengthen existing alliances and create new strategic alliances with other units at UA that will support attainment of strategic directions** including i) Expand access and enhance educational success of students, ii) Attract outstanding faculty and staff, iii) provide infrastructure to support excellence in discovery, learning and engagement, and iv) Deepen a strong financial foundation.

### **A. Current situation and gap between current situation and desired situation**

Strategic alliances with UA units within and outside of CALS have the potential to leverage resources by sharing strategic hires, equipment and other research resources, development of interdisciplinary research grant applications, and innovative academic programs responding to societal changes and improving job prospects for our graduates.

An example is the new Precision Nutrition and Wellness Initiative with the BIO5 Research Institute. Precision Nutrition is integral to multiple high priority strategic biomedical initiatives at UA, e.g., healthy aging, prevention of neurodegenerative disease, diabetes, heart disease and certain cancers. Strategic hires (joint appointments) and research collaborations would contribute to expanding interdisciplinary research and extramural funding and provide a greater base of faculty for mentoring undergraduate and graduate students and postdoctoral fellows. Strategic alliances can be formed with multiple programs and centers on campus.

### **B. Strategies to achieve goal**

1. Study shifting job market and needs, and identify opportunities for graduates trained in nutritional sciences;
2. Identify skills needed to compete for non-dietetic nutrition related jobs;
3. Identify UA programs that would enhance training of nutritional science students;
4. Create study areas of concentration with appeal to nutritional science majors linked to job market;
5. Establish relationships (strategic alliances) with UA units supporting instruction and research priorities;
6. Establish curriculum and requirements for minor and/or certificate programs and mechanisms of instruction (traditional versus online);
7. Identify potential industry partners and establish relationships for internships, post graduate placement, sponsorships and other funding opportunities.
8. Develop research grants with strategic partners.

### **C. Actions**

#### **Time Period (Fiscal Years)**

Charge Development Committee: to assess job market trends, solicit input from alumni; industry leaders, students, other faculty – identify post graduate opportunities and necessary skill sets.	FY20
Identify potential partners (e.g., COM, CPH, COS, others) aligned with our student needs; Strengthen strategic alliances.	FY20-ongoing
Create new study areas of concentration; Establish curriculum and requirements for minor or certificate programs; mechanisms of instruction.	FY20-ongoing
Create new Interdisciplinary Graduate degree; Precision Nutrition and Wellness	FY21-22
Identify and engage industry partners.	ongoing
Develop marketing strategy targeting on campus, off campus, and industry partners.	ongoing
Offer new areas of concentration to undergraduate NSC majors (e.g, Precision Nutrition and Wellness).	FY20-21
Submit research grants with strategic partners.	ongoing

### **D. Inputs needed to achieve the goal**

- Faculty (NSC and strategic partners),
- Graduate teaching assistants
- Technical, web-based support for online classes
- Industry partners
- Alumni partners

**E. Objective metrics that will be used to track progress towards attaining goal**

- Strategic partnerships formed
- Industry partners
- New undergraduate and graduate degrees
- New courses offered
- Student enrollment in new degrees/minors/certificates
- Student placement
- Revenue generated by winter/summer courses; online classes
- Donors and funds received

## **INFRASTRUCTURE**

**STRATEGIC GOAL NINE: Provide infrastructure to support excellence in discovery, learning and engagement – Build for the Future:** *Plan and develop a building campaign or locate investigators (research signature areas, Precision Nutrition and Wellness; cancer biology) strategically.*

### **A. Current situation**

Infrastructure to support the investigators in the behavioral component of our signature areas was addressed by development of the Collaboratory for Metabolic Disease Prevention and Treatment and the move to the Abrams Building on Ajo Way. Faculty in the basic research signature areas, particularly precision nutrition and cancer-related research, need to be located near their colleagues on the medical campus to have access to the patients, human tissue samples and equipment. In order to sustain their work, faculty are gradually moving to the Cancer Center and the new BSRL. This fractures the Department and causes a loss of research dollars from CALS and the Department to the other units, especially COM and the Cancer Center. We need to locate as a group to a facility closer to the medical center. The laboratories that some faculty occupy in Shantz are very old and problematic as well. In addition to research laboratory needs, there is a need for a better Food Laboratory facility as we expand in the Food Science area. The current Foods Lab is too small and under-equipped to accommodate expansion in an area in which we have potential to grow and serve students and Arizona stakeholder needs.

### **B. Strategies to achieve goal**

1. Locate basic researchers into BSRL or Keating Building as a group.
2. Develop a building campaign for a new building, or at least, significant renovations to Shantz, including research laboratories and a Food Laboratory, with a certified kitchen.

### **C. Actions**

#### **Time Period (Fiscal Years)**

Convene NSC basic researchers to describe need and develop proposal that addresses those needs.	FY20-21
Explore existing options on campus to locate as a group.	FY20--21
Partner with other CALS units in Shantz and engage CALS Development Office to develop "building campaign".	FY20
Identify and pursue potential donors.	FY21-ongoing

### **D. Inputs**

- Faculty and staff.
- CALS Development Office
- Alumni/Community Advisory Board
- Donors

### **E. Objective Metrics**

- Completion of development plan.
- Donor support (revenue)
- Successful move to new space.
- Statistics on graduate program including time to degree, number of degrees awarded.
- 5 and 10 year postgraduate survey.

## RESEARCH

### **STRATEGIC GOAL TEN: Advance in signature research areas and support a strong culture of research**

**productivity and mentoring:** *Attract and retain outstanding and diverse faculty and staff to advance signature research areas, enhance strength in UA priority areas (precision nutrition; aging; brain, neurodegenerative disease, cognition; inflammation, cardiometabolic disease prevention, cancer biology, prevention), and collaboration with strategic partners.*

#### **A. Current situation**

Our signature research areas are highly fundable (funded by NIH, USDA, DOD, NSF, DOE, etc.) and we have competed for grants successfully. We are recovering from significant research faculty attrition (~\$2.5M/yr), particularly at the Professor level (~5 FTE). Nutrition and physical activity are vital to successful aging, disease prevention, maintaining physical and cognitive vitality. Building collaborations with other biomedical groups and enhancing collaborations tied to the UA Strategic Priorities is expected to sustain long-term growth.

#### **B. Strategies to achieve goal**

1. Identify strategic partners, create alliances, and pursue shared strategic hires.
2. Develop research professorial appointments.
3. Engage CALS development office and pursue donors for endowed faculty.
4. Submit grants for fellowships for postdoctoral training in NSC signature areas; submit interdisciplinary training grants.
5. Strengthen mentoring in progress to promotion and tenure/continuing status to assure hires are successful.
6. Seek nominations for awards and honors.
7. Reward excellence (salary, space, travel funds, bonus).

#### **C. Actions**

Update strategic hiring plan.	FY20 - ongoing
Create UA recognized Center for Precision Nutrition and Wellness.	FY20-21
Create alumni/community advisory board to support fundraising/donors.	FY20 - ongoing
Identify and pursue potential donors	FY20 - ongoing
Create development plan with CALS development office and institute the plan.	FY20 - ongoing
Identify funding opportunities and submit postdoctoral training grants (NIFA; USDA).	FY20 - ongoing

#### **D. Inputs**

- Faculty
- Alumni and community supporters
- CALS development office
- UA strategic partners
- CALS/UA financial support for faculty hires

#### **E. Objective Metrics**

- Postdoctoral training grants submitted; fellowships supported
- Donors; endowed faculty chairs
- Staff time, CALS development office
- CALS financial support for faculty hires
- Faculty hires

**EXTENSION**

**STRATEGIC GOAL ELEVEN:** Maintain and expand NSC Extension and Outreach programs in support of solutions to the state and nation’s food (food safety, food systems, food security, local foods production, food processing industries, and food service), nutrition (nutrition education; food preparation) and the health behaviors (e.g., food choices, physical activity) related to health promotion and chronic disease prevention (obesity, Diabetes, etc.).

**A. Current situation and gap between current situation and desired situation**

The University of Arizona, Department of Nutritional Sciences in partnership with the Arizona Nutrition Network work jointly to coordinate, administer and evaluate nutrition and physical activity initiatives throughout Arizona (SNAP-Ed, EFNEP, Diabetes Prevention Program). There are no systematic, systemic connections between the students in NSC, other CALS units, Extension and the programs in the community and industry.

**B. Strategies to achieve goal**

1. Maintain EFNEP funds and increase SNAP-Ed and other USDA Research/Extension/Education Funding
2. Increase awareness of existing Extension programs for our students
3. Develop new Department of Nutritional Sciences and Extension Educational (NSC-EE) programs, including Internship programs in cooperation with other units/colleges, e.g., COM, CON and COPH, and county health departments. These Interns may or may not pay tuition with the possibility of securing funding/hiring after their internships as program coordinators in research or community programs.
4. In addition to educational programs for students, develop community experiences, e.g., food entrepreneurial assistance, retail food safety, training assistance, and Industrial or public health wellness program in collaboration with community groups and agencies.

**C. Actions**

**Time Period (Fiscal Years)**

Maintain/increase EFNEP and SNAP-Ed funding; better integrate programs	ongoing
Develop sustainable programs, including Diabetes Prevention Program and Culinary Medicine	ongoing
Strengthen relationships with County Agents	ongoing
Strengthen Extension collaborations with other colleges (COM, CON, COPH)	FY20-21-ongoing
Increase numbers of students engaged in Extension programs	ongoing
Improve Extension website in the department	FY20-21
Develop the NSC-EE Internship	FY21-22
Find the resources (sponsors, budgets, etc.) to maintain Extension programs	ongoing
Recruit staff and Extension members for NSC-EE Internship	FY21-22
Recruit student interns	FY22-ongoing
Initiate NSC-EE Internship	Fall, 2022

**D. Inputs needed to achieve the goal**

- Students
- Faculty for teaching, mentoring and coordination of the internship
- Website development – web designer and web developer □ Funding from grants (e.g., SNAP-Ed)

**E. Objective metrics that will be used to track progress towards attaining goal**

- Number of students engaged in Extension Programs
- Number of sponsors
- Number of NSC-EE Interns
- Revenue



# School of Plant Sciences

## PLANT SCIENCES 2019-2025 STRATEGIC PLAN

**Context and Opportunities:** Our ability to maintain an agricultural system capable of supporting the ever-increasing global population faces major challenges as a result of climate change, increasing degradation of arable land, rapidly expanding urbanization, limited natural resources, and increasing environmental pollution. These challenges will require us to rethink how we sustainably produce food, feed, fiber, and fuel with limited water, high temperatures, and poor quality soils, while simultaneously improving plant, human and environmental health. SPLS is positioned to address these challenges using approaches inherent to the 4th Industrial Revolution (4IR) and contribute to the strategic goals of the university in shaping a resilient natural and built environment. We are specially positioned to address challenges associated with agricultural ecosystems in arid and semi-arid environments, as we possess a highly impactful research and training expertise in fundamental plant and microbial sciences, and a highly effective applied research and extension/outreach programs with strong stakeholder networks in Arizona and the southwest.

**Purpose:** Increase productivity and sustainability of plant systems in agricultural and urban environments, especially in semi-arid and arid environments. Specifically, we will:

- Build instructional programs that prepare students to address current challenges in plant and microbial systems and to foresee disruptions and opportunities arising from the Fourth Industrial Revolution (4IR). These programs will align with our current and future research expertise to ensure students have a solid academic foundation as well as essential experiential learning opportunities that develop interdisciplinary problem solving.
- Generate fundamental knowledge about plants and their associated microbial communities at the molecular, cellular, organismal, population, and community levels, communicate this knowledge to our students and engage graduate and undergraduate learners in discovery and active-learning.
- Integrate basic and applied research with technological and informatic advances to improve growth, development, and adaptation of crop and urban plants in varied and changing environments.
- Disseminate our discoveries through extension and outreach activities for stakeholders locally, regionally, nationally, and internationally.

**2025 Vision:** We envision a leadership role for the School of Plant Sciences in generating and disseminating knowledge needed to address looming crises in productivity and sustainability of agricultural and urban plant systems in arid environments. We will provide leadership both through research discovery, publications and undergraduate and graduate instruction and training. Outcomes of our vision will include: a broadly trained, job-ready workforce prepared to meet future challenges to agricultural and urban plant systems; robust research and extension programs that support plant improvements through genetics, create novel strategies for mitigating plant disease and improving food safety, and develop innovative land management strategies to optimize plant growth.

**Mission:** Achieving our vision will require us to:

- Capitalize on our research diversity, cyberinfrastructure, and strategic resources.
- Develop strong communication among faculty and with stakeholders.
- Continually identify strategic opportunities in research, instruction, and outreach.

**Shared Values:** Importance of combining and maximizing our strengths in basic and applied plant and microbial science to combat obstacles to agricultural production and urban plant use.

**Summary:** This document represents faculty-generated goals, priorities, and associated activities that will position us as leaders in meeting the challenges facing plant and microbial science in arid environments. Included are plans for strengthening our educational activities (expand/enrich undergraduate experience and success and enhance graduate education), and for integrating fundamental, applied, and extension research into novel strategies for our diverse stakeholders (increase research funding and productivity and meet challenges in plant and microbial science in arid environments).

All members of the SPLS faculty were given the opportunity to participate in the preparation of this document and to comment on its content. As much as is possible, the goals presented represent the general consensus of participating faculty. However, we are a diverse faculty and there is dissent and debate on aspects of this strategic vision. Alternative viewpoints will continue to be considered as faculty in the School works towards these goals.

**STRATEGIC GOAL ONE:**  
**Expand/enrich Undergraduate Experience and Success**

**A. Current situation and gap between current situation and desired situation**

The number of SPLS undergraduate majors (Plant Sciences (PLS) and Sustainable Plant Systems (SPS)) tripled from 37 to 108 in the six years preceding 2019. As of March 2019, there were 67 SPS majors and 41 PLS majors. The growth in number of undergraduates requires adjustments to ensure quality instruction, effective mentoring, and efficient advising. Additionally, we want to further increase the number of students in our majors. To these ends, we **Aim** to:

1. Increase the number of students in SPLS majors while maintaining exceptional mentoring and advising.  
Present and target enrollment numbers:  
FY19: 108 undergraduate majors  
FY21: 125 undergraduate majors (SPS 78; PLS 47)  
FY23: 130 undergraduate majors (SPS 81; PLS 49)
2. Expand and enhance our curriculum to provide cutting-edge knowledge and interdisciplinary training necessary for Fourth Industrial Revolution (4IR) transitions in areas such as biotechnology, crop improvement, innovative production systems, precision agriculture, and plant health.
3. Provide student-centered active and collaborative learning approaches in all courses offered by the School for our majors, and integrate our research expertise into classroom teaching.
4. Prepare students for employment by facilitating internship and training opportunities, and by focusing on data competencies required for jobs in the 4IR.

**B. Strategies to achieve goal**

1. Ensure that the CALS recruitment team conveys an appropriate, effective message about our SPLS majors as they work to promote CALS majors, career opportunities, and courses to prospective students. [Aim 1]
2. Support the CALS Recruitment team by interacting with prospective students directly at targeted events. [Aim 1]
3. Ensure that the required courses we offer promote the acquisition of 4IR-appropriate skills, such as collaboration, leadership, data-engagement, digital and technical competency, problem-solving, and creativity. [Aims 2, 3 and 4]
4. Develop special activities (e.g., posters, arts, panel discussion, research symposia) and incorporate additional research-based teaching practices to promote personalized, collaborative and interactive learning. [Aim 3]

**C. Actions**

1. Establish workflow between unit head and curriculum, recruitment, and website committees to identify and promote our 'brand' and strengths. [Strategy 1]
2. Meet with CALS recruitment periodically to convey our desired recruitment message. [Strategy 1]
3. Review recruitment materials (e.g. brochures) annually, to ensure that the information is current and that they convey accurate messaging. [Strategy 1]
4. Provide table displays and faculty/student representatives at select CALS recruitment events. [Strategy 2]
5. Provide presentations and promotional materials relating to SPLS programs to University Professional Advisors. [Strategy 1]
6. Mentor and advise student researchers in laboratories. [Strategies 3 and 4]
7. Emphasize project based and experiential learning in all courses offered by the School as part of the PLS and SPS majors. [Strategies 3 and 4]

8. Identify and facilitate internship and practical training opportunities for undergraduate students. [Strategy 4]
9. Participate in SCI 295b (Research Readiness for underrepresented minorities) [Aims 1 and 3]
10. Continually improve and update an interactive, content-rich, and easy to navigate SPLS website that effectively recruits PLS and SPS majors. [Strategy 1]
11. Integrate 4IR-consistent skills into student assessments into SPLS courses for our majors [Strategies 3 and 4]
12. Employ active or applied teaching and aim to meet or exceed the UA Strategic Plan goal of 20% by 2020 and 40% by 2025. [Strategies 3 and 4]
13. Track student progress after graduation by maintaining records and contact information for SPLS alumni, possibly by annual post-graduation surveys that ask for updated contact information and current employment status. [Strategy 1]

#### **D. Inputs needed to achieve the goal**

1. Engaged and coordinated curriculum committees, faculty instructors and unit leadership to drive program improvements. [All aims; Action 1]
2. Undergraduate recruitment committee member to coordinate SPLS recruitment with CALS recruitment and marketing. [Actions 2-4]
3. Program coordinator to provide the following functions:
  - 3.1. Promote SPLS programs to University Professional Advisors [Action 5]
  - 3.2. Liaise with industry and government to help identify student training and employment opportunities [Action 8]
  - 3.3. Update and improve recruitment-related pages of SPLS website by, for example, highlighting current and past student successes [Action 10]
  - 3.4. Monitor inclusion of 4IR-consistent skills, active learning strategies, and applied experiences in our courses [Actions 11]
  - 3.5. Track and engage SPLS alumni after graduation, including by obtaining and processing data from CALS exit surveys of graduating students [Action 13]
  - 3.6. Obtain objective metrics, as listed in section E, below, to track progress [Section E, below]

#### **E. Objective metrics that will be used to track progress towards attaining goal**

- Student enrollment in SPLS majors.
- Number of student credit hours.
- Number of students placed post-graduation.
- Number of presentations to biology classes and minority groups.
- Number of student researchers.
- Number of interns and practical trainees.
- Number of visitors to SPLS website and inquiries into SPLS majors.

**STRATEGIC GOAL TWO:**  
**Participate Collaboratively in the Administrative Leadership**  
**of the Microbiology Undergraduate Major**

**A. Current situation and gap between current situation and desired situation**

- In recent years, the undergraduate major in Microbiology has been overseen by diverse leaders (the Microbiology Commission, the Associate Dean of Academics, and the Department Heads/Directors of Veterinary Sciences and Microbiology, Plant Sciences, and Soil, Water and Environmental Science). Thus, Microbiology has had no single person focused full time on its oversight and for many years it had no official, standing committees.
- In Fall 2012, Associate Dean Joy Winzerling proposed a cross-unit committee to oversee the curriculum, recruitment, and related operations of the Microbiology undergraduate major. This committee was active from that point forward, and several years ago changed its format to be more representative and inclusive of those teaching actively in the Microbiology major.
- The committee is chaired by a member of one of the most active teaching units in the major (either the School of Animal and Comparative Biomedical Sciences or the School of Plant Sciences); vice-chaired by a member of the other of those units; and consist of a core group of faculty from those units who teach actively. This committee interacts with a larger community of actively teaching faculty whose courses serve Microbiology majors. The committee currently is overseen by the Director of ACBS, who interacts in a collegial fashion with the Director of SPLS.
- The principles that guide the aims of this committee are as follows:
  - The undergraduate microbiology major is one of the largest in CALS (~300 students), one of the larger biology-based undergraduate programs in the University, and one with exceptional potential to grow.
  - To enhance undergraduate programs in Microbiology, we should develop coordinated efforts to adapt them to 21st century technologies and recruit students using a faculty-inspired approach.
  - There is a great need for trained microbiologists in diagnostics, food safety, quality control, environmental microbiology, plant and animal health, bioremediation, alternative fuel production, health care, and clinical laboratories.
  - Partnerships among the active instructors' units and a clear plan for leadership and growth will improve the major and faculty involvement.
- To best serve students and the state, a strong program in Microbial Sciences must be maintained in CALS. We propose that our microbiology-related faculty participate contribute to charting the future of the Microbiology Program by: (a) participating collaboratively in the cross-unit microbiology committee; (b) considering joint appointments in the School that will house the program, if relevant; (c) continuing to teach the core courses in Microbiology for which we are responsible; and (d) working to strengthen ties with other microbiology-oriented units in CALS and across the UA.

**B. Strategies to achieve goal**

1. Participate in cross-unit Microbiology committee to help chart the future of the Microbiology program.
2. Continue our strong tradition of teaching in microbiology.
3. Encourage SPLS faculty to seek joint positions in the School of ACBS.
4. Continue to cultivate appreciation of microbiology-related sciences and personnel in SPLS.

**C. Actions**

1. Participate in cross-unit committee and leadership roles therein.
2. Investigate joint positions in ACBS.
3. Encourage SPLS faculty whose work relates to microbiology to continue to participate actively in SPLS activities.

4. Explore cross-campus and college-wide collaborations for outreach, research, and related activities that will enhance Microbiology presence on campus.

**D. Inputs needed to achieve the goal**

- Cohesion among CALS Microbiology faculty with a common goal: enhancing the major and, in future efforts, the graduate program.
- Continued integration of SPLS faculty interested in Microbiology with efforts underway in other units.

**E. Objective metrics that will be used to track progress towards attaining goal**

- Increase in applicants, enrollees, and graduates of the Microbiology undergraduate program.
- Development of a privately sponsored cross-university Microbiology seminar series.
- Development of internship programs and corporate/private sponsorship for program enhancements.
- Increased recognition of Microbiological research excellence in SPLS and CALS via coverage by the school and CALS websites, faculty honors, and student achievements.

## **STRATEGIC GOAL THREE: Enhance Graduate Education**

### **A. Current situation and gap between current situation and desired situation**

Our goal is to provide a nationally recognized graduate program, providing training at the highest level for a broad array of careers in plant and microbial sciences.

*Metrics that reflect our current situation and our five-year goal:*

- Enrollment in PLS + PLP programs (MS and PhD)
  - FY19: 25 students in 11 labs
  - FY24: 30 students in 15 labs
- Time to PhD degree (three-year average):
  - FY19: 6.05 yrs
  - FY24: 5.50 yrs

### **B. Strategies to achieve goal**

1. **Recruitment:** Attract nationally competitive applicants directly, as well as through the umbrella recruitment program ABBS.
2. **Financial support:** Standardize and stabilize funding expectations for 12-month support at nationally competitive levels.
3. **Training:** Enhance student and advisor training opportunities and outcomes in the context of a broad range of careers, technological advances, and societal transitions.
4. **Community building:** Provide an inclusive, supportive environment with clear expectations of tolerance and respect.
5. **Program expansion:** Consider new degrees, including applied or accelerated MS or dual degrees.

### **C. Actions**

- **Recruitment:**
  - Update Graduate pages in School website annually
  - Maintain active involvement in ABBS recruitment
  - Actively engage with Graduate College recruitment system (Slate)
  - Actively engage in campus summer and winter research institutes (e.g., Latin American Research Program)
  - Ensure funding is available for in-person interviews for top candidates
  - Issue offer letters within one week of the interview
- **Financial support:**
  - Continue to encourage summer support for every student
  - Support faculty to convert off-semester teaching revenue to grad support
  - Provide institutional support for rotations in year one
  - Maintain or expand number of students supported on external fellowships
  - Continue to grow our donor base, prioritizing graduate scholarships
  - Standardize stipends at nationally competitive rates
  - Actively support faculty groups to self-identify and apply for domain-specific training grants; seek program-wide training grant opportunities
  - Actively seek corporate, non-profit, and agency participation in student support
- **Training:**
  - Actively promote student participation in CyVerse and other data training opportunities
  - Actively promote student participation in scientific communication training opportunities
  - Expand available travel funds and promote visits to off-campus labs, participation in workshops, or other enriching experiences
  - Actively cultivate opportunities for corporate, non-profit, and agency careers



- Continuously expand curricula to anticipate future areas of need and growth, including relevant aspects of the fourth industrial revolution
- Support a strong seminar program as a key component of graduate education and experience
- Improve assessment metrics and procedures to ensure accurate evaluation of training efforts
- Provide faculty training for successfully mentoring students with diverse career goals in a rapidly changing employment environment
- *Community building:*
  - Actively promote diversity and inclusion among students.
  - Provide faculty training for successfully mentoring students from diverse backgrounds
  - Actively support the Grad Club and their activities with the aim of enhancing professional development and student well being
  - Reward high-achieving students with available scholarship funding after recruitment is complete
  - Enhance interactions with related programs, including Microbiology, Molecular and Cellular Biology, Ecology and Evolutionary Biology, Soil, Water and Environmental Sciences, and others
  - Track graduates of our programs for inclusion in events, mentoring/internship opportunities, and to keep records, which are essential for grant opportunities.
  - Hold yearly faculty retreats to focus on graduate education
  - Encourage student involvement in outreach events, to positively impact the broader community and to reinforce the principle for the students
- *Program expansion:*
  - Develop new fast-track MS and/or BS-MS programs as feasible
  - Initiate and support dual degree programs with partner institutions abroad as feasible

#### **D. Inputs needed to achieve the goal**

- Faculty participation in all aspects of the graduate program.
- Centralized funding for TAs, for GenEd, service, and all lab courses.
- Centralized funding for rotations.
- School support for seminar series.
- School support for recruitment “weekend”.
- Prioritization of grad program support in development activities.

#### **E. Objective metrics that will be used to track progress towards attaining goal**

- *Recruitment:*
  - Number of applicants
  - Number of top-tier applicants that accept our offers
  - Number of students matriculating into our programs, directly and through ABBS
- *Finances:*
  - Scholarship funds available for first-year program
  - Proportion of students supported on external awards
- *Training:*
  - Number of students participating in internships, workshops, and other professional development activities
  - Number in PhD programs that leave with an MS
  - Publications
  - Years to degree
  - Number of students in professional positions within one year of graduation
- *Community:*

- Proportion of STEM underrepresented students
  - Number of faculty participating in training opportunities
  - Number of outreach events and number of student participants
- *Program expansion:*
  - New grad courses
  - New grad programs

## **STRATEGIC GOAL FOUR: Increase Research Funding and Productivity**

### **A. Current situation and gap between current situation and desired situation**

World challenges relevant to agriculture and plant and microbial science include an increasing population and rapidly expanding urbanization, limited natural resources, and increasing environmental pollution. These challenges will require us to rethink how we sustainably produce food, feed, fiber, and fuel in arid environments with limited water, high temperatures, and poor quality soils, while simultaneously improving plant, human and environmental health. SPLS has high-impact fundamental research programs in plant and microbial science with increasing emphasis on 4IR approaches and technologies, effective applied research and extension/outreach programs with strong stakeholder networks, and access to strong and diverse campus entities for partnering (e.g., CyVerse, the Controlled Environment Agriculture Center, the Department of Veterinary Science and Microbiology, the Department of Soil, Water and Environmental Science, and the Karsten Turfgrass Research Facility). Our goal is to position ourselves as leaders using plant and microbial science to overcome challenges to agriculture in arid environments.

Annual averages for the past 5 years: 41 grants awarded; \$6.7 million in research expenditures; 90 peer-reviewed research publications.

- 2019: 42 grants awarded; \$7 million research expenditures; 95 research publications.
- 2020: 45 grants awarded; \$7.25 million in research expenditures; 100 research publications.
- 2021: 48 grants awarded; \$7.5 million in research expenditures; 105 research publications.

### **B. Strategies to achieve goal**

1. Support and strengthen research programs of current faculty by increasing communication and collaboration.
2. Hire new tenure-track faculty to replace those retiring or leaving the unit, and to expand our research portfolio in areas of strength.
3. Increase interdisciplinary and/or intramural collaborations within the School, College, and University to enhance funding from traditional and non-traditional extramural sources (local, state, national, international, industry, commodity, foundations, private investors, and philanthropic organizations).

### **C. Actions**

1. Form consortia of faculty working in focused areas (such as genomics, reproductive biology, microbial ecology, etc.), with increasing emphasis on 4IR initiatives to establish research collaborations for extramural funding opportunities.
2. Continue to enhance interdepartmental communication by conducting annual/semi-annual School research retreats.
3. Participate in joint seminar series with other CALS (including YAC and MAC) and non- CALS units to foster inter-departmental collaborative interactions (e.g. training grants, Science and Technology Center grants, etc.).
4. Focus new faculty hires to enhance the development of theme strategic goals (e.g., arid lands agriculture, data-intensive plant research, digital agriculture) to develop centers of excellence within SPLS/CALS.
5. Initiate SPLS/CALS-wide working groups to identify research infrastructure needs and submit applications, both grant proposals and donor, to acquire said infrastructure

**D. Inputs needed to achieve the goal**

- Hiring of research-focused, tenure-track faculty to expand our areas of strength and replace retiring faculty members.
- Research consortia/centers in areas of emphasis.
- Joint seminar programs.
- Funds for retreats and workshops.

**E. Objective metrics that will be used to track progress towards attaining goal**

- Number and dollar value of funding proposals submitted.
- Number and dollar value of funding awards granted.
- Number of outreach and extension events and presentations at scientific meetings (posters, oral).
- Number of peer-reviewed publications.
- Number of research consortia/centers created, number of faculty participating, and number of activities for each consortia.
- Attendance at and feedback on School research retreats.