

**2020  
STRATEGIC IMPLEMENTATION PLAN**

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**COLLEGE OF ENGINEERING**



**Colorado State University**

# Strategic Initiative 1: Accelerate innovation and enhance learning experiences for our students in order to improve and bolster student success

**Objective 1.1:** Create more opportunities for student-centered active learning, team-based problem solving, and design projects.

**Actions:**

- Develop common first-year experiences for all COE undergraduate students that include college-wide, project-based, active-learning freshman engineering courses.
- Perform a survey of current practices and facilities that enhance active learning at peer engineering programs.
- Secure funding to create new state-of-the-art classrooms and laboratories that support team-based problem solving and design projects.

**Metrics and targets:** by 2020

- COE first-year courses incorporating student-centered active learning, team-based problem solving, and design projects
- Dedicated COE classrooms for COE courses with active learning and design projects

**Responsible individuals:** COE AD ASA, Engineering DHs and PDs, COE Development

**Objective 1.2:** Improve the retention and degree-completion rates of our undergraduate students.

**Actions:**

- Recruit and train a cohort of Graduate Teaching Fellows (GTFs) with a focus on enhancing learning and retention in first-year classes.
- Collect and analyze data on students choosing to leave engineering, including demographic information, academic performance, reasons for leaving, and where the students go after leaving.
- Engage the College of Natural Sciences in reviewing student experiences in the math and science courses, and develop recommendations for improving student success in these courses.

**Metrics and targets:** by 2020

- Funding for 30 GTFs
- 85% retention rate at the end of the first year
- 60% degree-completion rate for undergraduates



**Objective 1.3:** Incorporate innovation and entrepreneurship into a range of courses and projects, including multi-disciplinary senior capstone projects, through collaborative initiatives with other CSU colleges and programs as well as with industry partners.

**Actions:**

- Add entrepreneurship as an explicit component to the existing PLI program.
- In collaboration with the College of Business, develop a series of entrepreneurship and innovation courses.
- Develop an innovation and entrepreneurship concentration in the Engineering Science Program.
- Create incentives for existing departmental capstone design teams to include students from other disciplines.
- Increase the number of industry-sponsored capstone projects requiring multi-disciplinary design teams.
- Seek funding for an NSF I-Corps Sites grant and/or other funding to promote entrepreneurship.

**Metrics and targets:**

- Entrepreneurship element of PLI program by 2017
- New COE innovation and entrepreneurship courses by 2020
- At least one multi-disciplinary capstone project in each department by 2017
- 30 multi-disciplinary capstone projects each year by 2020
- 50 capstone projects sponsored by industry by 2020

**Responsible individuals:** COE AD ASA, Engineering DHs and PDs

**Objective 1.4:** Increase the number of undergraduate students participating in internship, co-op, and international experiences.

**Actions:**

- In collaboration with Front Range employers, develop a vision and strategy for CSU COE to be seen as the internship and cooperative education provider for the Front Range.
- Provide resources to the Engineering Success Center to expand the focus and support for internship and cooperative education programs.
- Develop strategic international relationships to increase the number of undergraduate students studying in other countries or with international internship or co-op experiences.

**Metrics and targets:**

- Comprehensive plan for engaging Front Range employees to place COE interns and co-op students by 2017
- 80% of students with one or more internship or co-op experiences by 2020
- 100 students per year on cooperative education assignments by 2020
- 20% of students with international experiences by 2020

**Responsible individuals:** COE AD ASA, COE Engineering DHs and PDs



## Strategic Initiative 2: Strategically grow enrollments in COE's undergraduate and graduate programs by recruiting and retaining a well qualified, energetic, and academically and culturally diverse pool of students

**Objective 2.1:** In support of CSU's 2020 Plan for enrollment growth, grow the number of undergraduate students while focusing recruiting efforts on attracting high-ability and more diverse students.

**Actions:**

- Coordinate and leverage undergraduate recruiting efforts at the departmental, college, and university levels.
- Explore creation of new undergraduate engineering programs and additional concentrations in the Engineering Science Program.
- Secure additional resources aligned with enrollment growth to safeguard academic quality, including appropriate increases in numbers of faculty and staff, and teaching facilities.
- Increase the number and total amount of funding for undergraduate scholarships, both need-based and merit-based.

**Metrics and targets:** by 2020

- 30% undergraduate student growth (to 2,900 students)
- One or more new undergraduate engineering degrees or concentration areas in engineering science
- \$1M/year in additional funding for undergraduate scholarships, including both need-based and merit-based scholarships

**Responsible individuals:** COE AD ASA, Engineering DHs and PDs, COE Development

**Objective 2.2:** Identify at-risk student populations specific to the COE and improve retention rates of these students.

**Actions:**

- Collect and analyze data on students choosing to leave engineering, including demographic information, academic performance, reasons for leaving, and where the students go after leaving.
- Establish student mentoring programs supporting at-risk students (first generation, low income, underrepresented), but open to everyone.

**Metrics and targets:** by 2020

- Retention and degree-completion rates of at-risk students equal to those of entire COE student body

**Responsible individuals:** COE AD ASA



### **Objective 2.3:** Grow enrollments in COE doctoral programs.

#### **Actions:**

- Increase the number and total funding available for graduate assistantships and fellowships to support doctoral students.
- Work with CSU administration to secure additional funding to support growth of Ph.D. programs.
- Provide support for the development and success of federally-funded doctoral training grants.
- Create incentives to reward faculty and departments growing the number of GRAs supporting Ph.D. students.
- Provide strong mentoring and advising along with expanded professional development opportunities for graduate students.

#### **Metrics and targets:** by 2020

- 20% doctoral student growth (to 375 students)
- Funding for 30 GTFs
- \$500K/year in additional funding for graduate fellowships
- One or more new doctoral training awards

**Responsible individuals:** COE RAD, COE DHs and PDs, COE Development

### **Objective 2.4:** Increase emphasis on professional master's programs, including coursework-only and online delivery of master's degrees.

#### **Actions:**

- Provide support, incentives, and policies to increase the number of COE graduate courses offered online.
- Develop strategic partnerships with international undergraduate institutes so that their best students are offered automatic admission to the M.S. degree and incentives similar to CSU's combined B.S./M.S. programs.

#### **Metrics and targets:** by 2020

- 50% of COE graduate programs available online
- 30% master's student growth (to 650 students, including resident and online)

**Responsible individuals:** COE RAD, Engineering DHs and PDs



## Strategic Initiative 3: Develop and sustain exceptional research programs with national and international impact

**Objective 3.1:** Expand support for team building to foster the ability to respond to opportunities, especially for high-risk, high-value, complex, and/or interdisciplinary proposals, and increase the diversity of research funding sources.

**Actions:** Roll out pilot programs during the next two years (by summer 2018)

- Develop a pilot program for mentoring, training, and support of faculty and research scientists to enable them to assume research leadership roles and to participate in the development and execution of new initiatives.
- Provide opportunities for networking and team formation/building.

**Responsible individuals:** COE RAD

**Objective 3.2:** Continue development of an effective and efficient research support structure.

**Actions:** Immediate

- Review current model for pre- and post-award support and recommend modifications to achieve an operating model that facilitates proposal development by faculty and research staff, and has the necessary infrastructure to seamlessly transition to post-award operation when the projects are funded, all with high efficiency.

**Responsible individuals:** COE RAD, COE DHs

**Objective 3.3:** Develop a comprehensive plan for recruiting and retaining top graduate students.

**Actions:** By 2017

- Develop and implement a program of student workshops and proposal reviews for fellowship opportunities.
- Work with corporate relations, development, and the RAD to secure sustained funding for named fellowships and assistantships, including those for international students.

**Responsible individuals:** COE RAD, COE Departments



**Objective 3.4:** Optimize the use and improve the condition of existing infrastructure and facilities, and identify possible needs for new infrastructure and facilities.

**Actions:** By 2017

- Conduct a comprehensive review of current COE facilities to identify strategic space reallocations and/or renovation needs, as well as the need for new infrastructure, considering research priorities and opportunities, costs, return on investment calculations, projections for growth in enrollments and research, and timelines.

**Responsible individuals:** COE RAD, COE DHs



## Strategic Initiative 4: Increase COE's contributions to economic development, public policy, and societal needs regionally, nationally, and internationally

**Objective 4.1:** Increase service learning and international project opportunities for both undergraduate and graduate students.

**Actions:**

- Increase external funding for individual students and student groups to participate in service learning and international projects.
- Provide training of undergraduate advisors to understand and support international experiences, and provide flexibility in undergraduate curricula to enable studying abroad without increasing time to degree.
- Provide incentives to support the development of content or full courses focused on economic and social progress in developing countries.
- Develop strategic partnerships with international institutions and sites, including the CSU Todos Santos Center.

**Metrics and targets:** by 2020

- \$100K/year in additional funding for student participation in service learning and international projects
- 25% of COE students with service learning or international experiences
- New courses focused on international development

**Responsible individuals:** COE AD ASA, Engineering DHs and PDs, COE Development

**Objective 4.2:** Increase the number of research and student projects in the COE that are in collaboration with external partners and communities.

**Actions:**

- Develop community-collaborative projects using senior design resources, vertically integrated program resources, and college-level internal funding to jumpstart these actions, with NSF or other federal funding to follow.

**Metrics and targets:** by 2020

- Funding for two new community-collaborative projects

**Responsible individuals:** COE AD ASA





**Objective 4.3:** Expand offerings of course work, certificates, and degrees to working professionals.

**Actions:**

- Work with department heads to provide teaching buyout for the development and instruction of short courses by both tenure-track and non-tenure-track faculty.
- Work with CSU Online to develop a suite of short courses to increase engagement with industry and address their continuing education needs.

**Metrics and targets:** by 2020

- 50% increase in number of COE short courses and certificates awarded, compared to academic year 2015/16
- 50% of COE graduate courses available online

**Responsible individuals:** COE Dean, COE DHs and PDs

**Objective 4.4:** Increase the COE's engagement in local, state, and national issues, and emerging research areas.

**Actions:**

- Provide travel funding to support COE faculty and staff to present at the Colorado State legislature through Innovation Breakfasts and special legislator-specific presentations.
- Provide support for teaching buyouts to faculty who are awarded RAPID or EAGER grants.
- Encourage and foster collaborations needed to secure large research projects or applications programs.

**Metrics and targets:** by 2020

- Two RAPID or EAGER grants

**Responsible individuals:** COE RAD, COE DHs and PDs



## Strategic Initiative 5: Enhance the diversity of COE students, faculty, and staff, and promote a culture of inclusiveness

**Objective 5.1:** Nurture a culture of respect for different views, personal backgrounds, and life experiences among our students, faculty, and staff.

**Actions:**

- Collect data on recruitment, retention, promotion, tenure, development and career pathing, performance ratings, demographics by job position and salary, grievances, and infusion of diversity in curriculum and co-curricular activities (by 2017).
- Develop and conduct an annual college climate assessment with the help of VPD and IR (including targeted versions for different populations within the College) (beginning 2017).
- Track students who leave engineering majors and interview or survey these students about why they chose to leave (beginning 2016).
- Establish expectations for faculty and staff for contributions to an inclusive college climate.

**Metrics and targets:**

- Successes and areas for improvement identified in cultural audit (annually starting 2017)
- Diversity criteria in annual evaluations for faculty and staff (by 2017)
- All COE faculty and staff with at least one hour of diversity-related professional development (by 2017)

**Responsible individuals:** COE Dean, COE DHs and PDs, COE Diversity Coordinator

**Objective 5.2:** Enhance support for student organizations.

**Actions:**

- Meet annually with Diversity Programs in Engineering student council to discuss how the College and departments can help the groups (beginning 2016).
- Start a new student organization for first-generation students in the College (2017).
- Allocate resources to fund proposals from student groups for projects enhancing diversity (beginning 2017).
- Increase recognition and/or other incentives for faculty and staff doing exemplary work as advisors for the student organizations (beginning 2016).
- Develop a page on the COE website that provides information on resources at CSU diversity offices (2016).

**Metrics and targets:**

- Increased active participation in student groups (particularly by underrepresented students)
- Demonstrable impact of participation and outreach activities by student organizations

**Responsible individuals:** COE AD ASA, COE Diversity Coordinator



**Objective 5.3:** Encourage partnerships and outreach that will connect CSU with more diverse populations.

**Actions:**

- Encourage the formation of research partnerships with other universities that have more diverse undergraduate and graduate student populations (beginning 2016).
- Provide incentives to encourage development of REU site proposals that can be used to bring diverse domestic students to CSU as undergrads (beginning 2016).

**Metrics and targets:**

- Number of partner institutions
- Applications for graduate school, post docs, and faculty positions received from partner schools
- Number of diverse undergraduates participating in summer REU programs

**Responsible individuals:** COE AD ASA, COE RAD, COE DHs and PDs, COE Diversity Coordinator

**Objective 5.4:** Expand and initiate activities that advance and create an inclusive climate in the College.

**Actions:**

- Secure new funding from both CSU and external sources to support diversity initiatives.

**Metrics and targets:** by 2020

- New initiatives supporting diversity underway
- Scholarship funding to support first-generation students
- Increased diversity of COE students

**Responsible individuals:** COE Dean, COE DHs and PDs, COE Development, COE Diversity Coordinator



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