THE COLLEGE OF ENGINEERING AND APPLIED SCIENCE

Strategic Plan 2011: Path to Excellence

2011-2016
Executive Summary

The College of Engineering and Applied Science (CEAS) at the University of Colorado Denver (UCD) is embarking on an ambitious strategic plan focused on the theme “Path to Excellence.” This plan is designed to fully support the UCD vision as expressed in its strategic plan, namely, by 2020, UC Denver will be a leading public university with a global reputation for excellence in learning, research and creativity, community engagement, and clinical care.

The College of Engineering and Applied Science was founded in 1964 with four departments, namely, Civil Engineering, Computer Science and Engineering, Electrical Engineering, and Mechanical Engineering. The College expanded to five departments in 2010 with the addition of the Department of Bioengineering. The College has continued a 90-year University of Colorado tradition that meets the needs of the Denver Metropolitan Area by providing nationally accredited engineering education in a flexible format that suits both students and employers.

Since its formation, the College has grown in student body and faculty size to be on a par with other small urban-oriented research institutions that have liberal arts and sciences at their core and who are interactive with a number of professional schools. In the short time of its existence, the College has entered the Tier 1 category of graduate engineering programs in the nation. Research strengths in the College were created by growth within the existing departments and undergraduate programs, originally designed for the working urban student. The College has recently been experiencing a dramatic increase of full time students. Over the past several years, the College and University have begun to build an effective culture of collaboration across disciplines and departments, recognizing the need to balance the basic sciences with the applied.

The strategic vision for the College of Engineering and Applied Science for the next five years will enhance and leverage a culture of collaboration. The College is committed to coupling research to education at both the undergraduate and graduate levels. College investments will prioritize multidisciplinary research which span the life sciences, the physical sciences, engineering, and information technology. At the undergraduate level, the College will prioritize foundational and experiential education that prepares students for innovation and success in engineering and computer science. The College will also transform both the undergraduate and graduate programs to ensure they engage our faculty strengths and that our students are empowered with sound engineering and computer science principles and the excitement of creativity and life-long learning. The College recognizes that our path to excellence will need to rely on resources derived not only from our faculty and administration but strategic philanthropic partnering with our alumni and friends.

This document presents four major strategic goals (SG) and a set of action items to achieve them. The strategic goals include:

SG1: Support and promote faculty research excellence that embraces multidisciplinary challenges to leverage our core strengths and provides experiential opportunities for our undergraduate and graduate students.

SG2: Transform undergraduate and graduate student engineering and computer science education into an experience that ensures both passion and opportunity for life-long success, innovation and leadership.

SG3: Restructure the College to promote excellence in our educational, research, and service programs by being responsive to our constituencies, aligning limited resources with College goals, developing the agility to pursue new promising opportunities, and developing a culture of continuous planning.

SG4: Establish an infrastructure capable of meeting, involving, linking, and nurturing relationships with key internal and external community partners, such as parents, retirees, alumni, elected and appointed decision-makers, business and industrial leaders, and urban and rural communities throughout the state and beyond.
I. Mission

The College of Engineering and Applied Science’s mission is to provide the highest quality engineering and computer science educational degree programs, to conduct cutting edge research in science and technology, to translate innovative new technologies motivated by research for the benefit of human society, and to become a catalyst for regional economic development.

II. The University at a Glance

In 1912, the University of Colorado established an extension division in Denver that was named the University of Colorado Denver Center. The Center was given authority to offer undergraduate and graduate degree programs in 1964. In 1974, the University of Colorado Board of Regents established the University of Colorado System, led by a president with each of its four campuses independently accredited and led by a chancellor. The University of Colorado campus in Denver was one of the designated independent institutions and the University moved to its current location, the Auraria Higher Education Center. The University has expanded beyond the boundaries of the campus and into the fabric of the city through strategic acquisition of real estate contiguous to the Auraria campus. In 2004, the University of Colorado Denver officially merged with the University of Colorado Health Sciences Center to create a new University. Initially called the University of Colorado at Denver and Health Sciences Center, it was renamed the University of Colorado Denver in late 2007. The University has 1,379 tenured or tenure-track faculty and a similar number of instructional faculty. Among the faculty are 15 members of the National Academies (4 National Academy of Sciences and 11 National Institute of Medicine) and numerous winners of national and international fellowships and awards. The current funded research for the University is now over 380 million dollars annually.

III. The College at a Glance

The College of Engineering and Applied Science (CEAS) was founded in 1964. CEAS is the only college in the metro region where a working individual can earn both undergraduate and graduate degrees in engineering entirely through late afternoon and evening studies. There are five departments in the College of Engineering and Applied Science at University of Colorado Denver: Bioengineering, Civil Engineering, Computer Science and Engineering, Electrical Engineering, and Mechanical Engineering. Currently, all departments offer MS degrees; all departments but Bioengineering offer BS degrees; and Bioengineering, Civil Engineering and Computer Science and Engineering offer PhD degrees. Proposals have been prepared to allow all five CEAS departments to offer BS, MS and PhD degrees by 2013.

The College of Engineering and Applied Science has approximately 615 undergraduate and 392 graduate students, and 44 full-time faculty, of which 38 are tenured or tenure-track and 6 are clinical teaching track faculty. The College is quite young. From the mid 1960s through 1993, CEAS was primarily an undergraduate college serving the working student population in the Denver Metro Area. In the past 5 years, this has changed with full-time students now outnumbering part-time students. In the short time span of only 15 years, the College has joined an excellent set of peer institutions among the nation’s top undergraduate and graduate programs in engineering. The College is committed to dramatically increasing its current ranking.

The College has nationally recognized faculty and state-of-the art facilities in several prominent programs and areas including imaging and biophotonics, radio science, cardiovascular biomechanics and hemodynamics, orthopedic biomechanics, and ophthalmology, sustainable urban infrastructures, environmental biotechnology, linguistic geometry, parallel and distributed computing, ultrafast laser technology, nonlinear spectroscopic techniques, computational mechanics, optimal control theory, inverse problems parameter estimation, solid/fluid interactions and nonlinear dynamical systems, and sports engineering, among others.
IV. Core Values (The Principles that Guide Our Strategic Vision)

**Excellence** demonstrated by our people, programs, and outcomes, as well as by the quality of our decisions and actions.

**Access with Support to Succeed** that gives all who desire the opportunity to take full advantage of the wealth of resources at CEAS and to be fully included in the UC Denver community.

**Integrity** that holds us accountable to our students, the community, and all who serve UC Denver’s mission, to manage our resources wisely and keep our promises.

**Diversity** that enlivens and strengthens our college, university, community, and society.

**Respectful Relationships** that build trust, inspire collaboration, and ensure the teamwork that is essential to CEAS success.

**Freedom** of speech, inquiry, pursuit of ideas, and creative activity.

**Sustainability** so that as we meet the needs of the present while not compromising the well being of future generations.

V. Strategic Vision: Path to Excellence

**Strategic Goal 1** Developing Excellence in Research

Support and promote faculty research excellence that embraces cross-disciplinary challenges to leverage our core strengths and provides experiential opportunities for our undergraduate and graduate students.

**Action Items for Strategic Goal 1**

1. Develop three to five nationally recognized areas of marked distinction within the College by identifying unique research capabilities, building upon the research strengths of the college, and developing roadmaps along with identifying resources to grow these areas into world-class research enterprises.

2. Recruit outstanding faculty who are at the forefront of their science and engineering disciplines by conducting targeted searches to bolster the areas of marked distinction and other departmental research and teaching priorities.

3. Significantly increase extramural funding for the College’s research enterprise that will enable the development of research laboratories, research experiences for graduate and undergraduate students, and national exposure of our faculty.

4. Exploit multidisciplinary research opportunities by partnering with faculty from across campus including the College and Architecture and Planning, the College of Arts and Media, the Business School, the College of Liberal Arts and Science, the School of Medicine and the School of Pharmacy.

5. Re-engage the senior faculty in a more active research role by providing incentives such as a differential workload and a faculty evaluation system that better rewards research excellence, by identifying research opportunities that match our faculty’s expertise, and by identifying existing research groups with overlapping interests with our faculty.
6. Develop a culture of research entrepreneurship that rewards faculty for the development of Intellectual Property (IP) and spinoff companies by including these activities in the annual evaluation of faculty and in the considerations for reappointment, tenure, and promotion.

**Strategic Goal 2  Developing Excellence in Undergraduate and Graduate Education**

Transform undergraduate and graduate student engineering and computer science education into an experience that ensures both passion and opportunity for life-long success, innovation and leadership.

**Action Items for Strategic Goal 2**

1. Create the Office of Student Affairs in the College with the charge of developing programs for enhanced student retention and yield, performing outreach to K-12 students in the Denver metro region and the state of Colorado, and developing recruitment strategies and programs to attract students from outside of Colorado and internationally.

2. Develop a college-wide faculty-lead advising and mentoring program for both undergraduate and graduate students.

3. Develop and execute a systemic approach for improving the success and graduation of students once they are enrolled, with special attention to the strategic partnerships, physical, curricular, and cultural elements that must be in place and wholly integrated to create a fully supportive environment.

4. Strengthen the focus within the undergraduate and graduate curriculums to emphasize communication skills, leadership skills, creativity, and the ability to work in multidisciplinary groups.

5. Renovate our undergraduate design course sequences in engineering and computer science so that they span from the freshman to senior years, they actively engage our students in the creative power of experimentation, modeling, computation and visualization, and, whenever possible, they include a prototype build phase.

6. Encourage the development of joint courses and multidisciplinary design experiences for students that span both Departments and Colleges.

7. Insure that the latest technological advancements are incorporated into the curriculum and that the curriculum evolves into new, multidisciplinary fields.

8. Be responsive to the educational and training needs of working professionals within the Denver Metro Region by expanding educational extension services, continuing the delivery of late afternoon, evening, and online classes, and developing new certificate and degree programs.
Strategic Goal 3  Restructuring the College of Engineering and Applied Science

Restructure the college to promote excellence in our educational, research, and service programs by being responsive to our constituencies, aligning limited resources with College goals, developing the agility to pursue new promising opportunities, and developing a culture of continuous planning.

Action Items for Strategic Goal 3

1. Reduce barriers between departments within and outside the College to foster the emergence of the “areas of marked distinction” and other core research “clusters.”

2. Develop a culture of promoting excellence in customer service for all our constituencies including our students, other departments and organizations within the university, local businesses and industry, and visitors to the College.

3. Implement efficient administrative procedures that reduce bureaucratic impediments to the development of innovative educational, research and service programs.

4. Align College resources with the goals set forth in the strategic plan but, at the same time, reserve some level of funds for new high-risk high-reward activities.

5. Develop a culture of continuous planning within the College in which the strategic plan becomes a living document which is continuously updated and revised based on assessment of goals and changing interests and opportunities.

6. Develop highly effective programs for mentoring, developing, recognizing and rewarding CEAS faculty and staff.

7. Encourage a spirit of entrepreneurship within the college that empowers faculty to develop resources necessary to establish new innovative teaching, research, and service programs.

Strategic Goal 4  Maximizing our Impact

Establish an infrastructure capable of meeting, involving, linking, and nurturing relationships with key internal and external community partners, such as parents, retirees, alumni, elected and appointed decision-makers, business and industrial leaders, and urban and rural communities throughout the state and beyond.

Action Items to Achieve Strategic Goal 4

1. Empower the Engineering Leadership Council (ELC) and add further leaders from industry and government to the ELC aligned with and impassioned by a vision of the University of Colorado Denver and committed to helping the College identify and attain the resources needed to attain the College’s goals.

2. Create departmental committees that engage successful alumni and friends from academia and industry who are dedicated and adept at advancing excellence and generating resources at the program level.

3. Promote the establishment of UCD as an economic anchor in the Denver Metro Region by creating partnerships with local companies and industry.
4. Identify and develop new programs that can generate revenue streams such as the proposed program in Sustainable Construction Engineering and Management.

5. Determine realistic financial requirements and fund raising priorities for the next five years necessary to attain CEAS educational and research strategic goals.

6. Strengthen our service commitment to the community and to the engineering and computer science profession through the continued development of our extension program, the development of new certificate and other retraining programs, and the participation in national professional organizations.

7. Develop and execute a plan to ensure that CEAS is able to recruit and retain diverse and talented leaders, faculty, staff, and students that reflect the diversity of the state of Colorado.

8. Develop an organizational infrastructure and comprehensive plan that establishes a solid foundation for a multi-year friend- and fund-raising campaign, resulting in a growing and sustained donor base.

VI. Next Steps

1. Identify leaders for the four strategic goals who will develop appropriate action and assessment plans.

2. Communicate the College Strategic Plan to CEAS constituencies.

3. Encourage department chairs to align their department strategic plans with the CEAS strategic plan.

4. Schedule biannual reviews chaired by the dean to assess progress on strategic objectives supported by the appropriate metrics and to revise the strategic plan where necessary.

5. Encourage a college culture that will enthusiastically promote continuous planning and support new ways of doing business by empowering all constituencies.

College of Engineering and Applied Science - Strategic Planning Team

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