

MINUTES AND RECOMMENDATIONS
Engineering Advisory Council Meeting – 4/16/04
College of Engineering & Applied Science
University of Colorado at Boulder

INTRODUCTIONS AND ANNOUNCEMENTS

EAC Chair George Sissel introduced two guests, Jean Becker from McDATA Corporation and Michael Herriage from Northrop Grumman, who attended the meeting as prospective new members. All attendees introduced themselves.

PRESIDENT'S ADDRESS

CU President Betsy Hoffman made a presentation on the revenue base for higher education (copies of slides were included with the meeting materials). The proportion of the Colorado state budget spent on higher education has declined from 20% in 1990 to 11% in 2004. Unless changes are made, it will continue to decline because the Taxpayers Bill of Rights (TABOR) limits increases on the total budget by inflation whereas Amendment 23 requires that expenditures on K-12 education (the largest budget item) increase by inflation plus 1%. The state appropriation is 9.6% of the CU system budget in 2004, down from 25.1% in 1990. The 2005 Colorado budget has flat state appropriations plus 1.1% increase in tuition (this budget has subsequently been approved by the Governor), which is projected to give a \$27M shortfall (due to rising costs) in FY05 for the CU system. Senate Bill 189 would provide vouchers for Colorado students attending college in the state and provide enterprise status to CU (this bill has subsequently passed and was signed by the Governor). The Governor vetoed a budget amendment allowing schools with enterprise status to raise tuition by 8%, instead asking that tuition increases be negotiated with the Colorado Commission on Higher Education. Various legislative reforms (requiring voter approval) are being considered for resolving the incompatibility between TABOR and Amendment 23, and allowing for future investment in higher education (but none of the proposals subsequently received the required two-thirds majority vote to bring it to the voters).

DEAN'S REPORT

Dean Robert Davis thanked President Hoffman and noted that she had recently been burning the candle at both ends and in the middle by overseeing the CU system, being the leading advocate for change in funding of higher education, and addressing issues associated with the athletics scandal. Dean Davis then noted that a personnel situation in the College was finally resolved when the Board of Regents approved the dismissal of a faculty member accused of sexual harassment and inappropriate conduct. The Dean then provided recent highlights and updates on the College (copies of slides were included with the meeting materials). Of particular note are Frank Barnes winning the National Academy of Engineering Gordon Prize (\$500,000 given to one engineering educator each year for innovation), Kristi Anseth winning the National Science Foundation Waterman Award (\$500,000 given to one young scientist or engineer each year for extraordinary research accomplishment), and the election of George Born and Kaspar Willam to the National Academy of Engineering. Student awards include two teams as Outstanding

Winners in the national Mathematical Contest in Modeling and the *Colorado Engineer Magazine* selected as the Magazine of the Year for the second year in a row. *U.S. News and World Report* has ranked the College's graduate program as 33rd overall (up from 37th last year), with three departments in the top 20 (AES, ChBE, CEAE). Undergraduate first-year enrollments for Fall 2004 are projected to be about the same as Fall 2003 (about 600 students), with women up from 14% to 18% and underrepresented minorities up from 5.7% to 6.5% of the entering class. The Dean echoed the President's concerns about the state budget, noting that Colorado's expenditure of less than \$4 per \$1000 of personal income ranks 48th in the county and that its tuition and fees of just over \$4000 per resident student are the 3rd lowest in the American Association of Universities. The budget outlook for FY05 is dependent on not-yet-set tuition rates. If tuition is increased only at the 1.1% inflation, then a campus shortfall of about 5% of its general fund may occur (due to a decline in nonresident enrollments, flat state support, and increases in staff salaries, medical benefits, and fuel costs that exceed inflation). Vern Norviel recommended that college budget planning include a significant target for intellectual property revenues (e.g., 7 figures versus current 5 figures per year). Finally, Dean Davis noted that the College's Strategic Plan for Excellence was completed in December 2003, and several of the proposed educational and research initiatives are underway. Major building expansion projects are awaiting private fundraising.

DEVELOPMENT UPDATE

Marc Thompson reported that private fundraising for the College of Engineering and Applied Science this year is projected at 21% ahead of last year, while projections campus-wide are down 9%. The number of donors is also up in the College.

EDUCATIONAL INITIATIVES

Associate Dean John Bennett presented an overview of educational initiatives in the College, primarily associated with the Strategic Plan (copies of the slides were included with the meeting materials). Areas include renewed focus on education at the college level, education for leadership and citizenship, outreach to rural communities, wider coverage and other educational infrastructure improvements, improved recruiting and diversity, and assessment. Kristin Germain, Director of Outreach and Education, then discussed outreach programs to K-12 students and teachers, largely focused on personal contact. Overall objectives are to increase quality and diversity of students in the College. Barriers to success include lack of adequate financial aid and perceptions of CU's reputation as a party school versus the College as the top-ranked engineering school in the state/region. Peter Mannetti asked if student loans could be made from endowment funds. Jill Tietjen suggested partnering with Project Lead the Way and also that the College put outreach demos (of engineering and science principles) on the web and link them to the campus outreach web site. Kristin noted that only a few EAC members had responded to her request for help in calling prospective students, though one member noted he had volunteered but then was not used. Terry Mayes, Director of Academic Programs and Assessment, then gave a presentation of her responsibilities (active learning, advising, assessment and accreditation) in this newly created position. She also described the pilot Earn-Learn Program, which had 15 apprentices in Spring 2004. Three apprentices gave testimonials on their experiences: Andrew Campbell (an AES/ME

junior working in the Integrated Teaching and Learning Laboratory), Brede Wegener (an AES junior working in the Integrated Teaching and Learning Laboratory), and Kelly Hughes (a ChBE sophomore doing K-12 outreach). Private fundraising for the Earn-Learn Program this year has led to \$87K in current gifts, \$147K in endowments, and approximately \$750K in endowment bequests—it appears to be very popular with donors. Terry also asked EAC members to let her know about internship opportunities and contacts at their companies.

RESEARCH INITIATIVES

Associate Dean Stein Sture presented an overview of research initiatives linked to the College's Strategic Plan (copies of slides were included in the meeting materials). Progress includes the receipt of initial federal funding to establish a Nanotechnology Laboratory and Characterization Facility, the formation of the new Research and Engineering Center for Unmanned Vehicles (RECUV, directed by Brian Argrow) and Computer and Communications Security Research and Education Center (directed by Alex Wolf), a memorandum of understanding with Sandia for research in microtechnology and nanotechnology, and a new process for technology scouting of recent grant awards. Professor Brian Argrow then presented an overview of the RECUV Center and the applications of unmanned aerial vehicles in military defense and in civilian applications such as monitoring pollution, fires and weather. Assistant Dean JoAnn Zelasko gave an update on the Discovery Learning Center, including its increased use and the piloting of 12 Discovery Learning Apprentices in Spring 2004. Finally, two of the apprentices (Katie Medina, a CEAE junior working on water filtration, and Jake Nelson, an AES junior doing research on networking of unmanned aerial vehicles) gave tours and demonstrations of their work in the Discovery Learning Center.

DISCUSSION WITH THE CHANCELLOR

Chancellor Byyny had a last-minute conflict (related to testifying in the investigation of the athletics program) and was not able to join the EAC/RDC for discussion.

CEAE DEPARTMENT UPDATE

Professor JoAnn Silverstein, Chair of Civil, Environmental, and Architectural Engineering (CEAE), gave an overview of her department (a handout of her slides was distributed at the meeting). The CEAE Department focuses on innovative curricula and research on sustainable development and management of civil infrastructures and natural resources. Its graduate program is ranked 20th in the country by *U.S. News & World Report*, and it is 5th highest in terms of the number of PhD degrees granted per year. Initiatives include research for sustainable infrastructure, response of civil infrastructure to extreme events, design of buildings and communities for energy conservation, and educational enhancements of the BS/MS degree, internships and other hands-on experiences, and service learning through Engineering for Developing Communities. Alyssa McCluskey, a PhD candidate in the CEAE Department, then shared her experiences beyond the classroom while at CU. These experiences included research, teaching, study abroad, and president of the Chi Epsilon student organization while an undergraduate. As a graduate student, she has done research on river-basin modeling and assessing impacts of climate changes on water and food supply and demand, including

opportunities to work in the field with policy makers and share holders, both domestic and international. She emphasized the very positive experience gained by having the opportunity to combine her research interests with work experience. This presentation was a very good segue into the brainstorm session on globalization.

GLOBALIZATION BRAINSTORMING

Associate Dean John Bennett led a discussion to get input from EAC members on actions/initiatives the College should undertake to address the increasing trend of outsourcing high-tech jobs to highly educated, lower-cost countries such as India. Almost all of the EAC members have had experience with such a decision and with globalizing their work forces, particularly software developers. Their recommendations included:

- Our degree programs should include leadership and project management courses; managers and project architects are not being outsourced
- Systems engineering (project specification and high level design) are not being outsourced
- Our students need to have international awareness and skills in dealing with many cultures

The EAC also provided feedback on the request the College has received to offer the Engineering Management degree in Nansha, China in partnership with Nansha IT Park. The EAC cautioned us to carefully consider the reasons for pursuing this opportunity and to not just offer it as a revenue source. They cautioned that the “hidden” costs, such as the jet-lag impact on faculty effectiveness, will have more impact than we may be estimating. The EAC concluded that they did not see that we had thought through why this opportunity is strategic to the Engineering Management Program’s or College’s primary mission. Kristy Schloss recommended that we benchmark and learn from other universities that have developed international programs. Enid Ablowitz noted that there have been other international initiatives at CU that did not work, and Jon Liebman said there have been few successes and many failures of such programs and that we should do something different. Vern Norviel recommended that we build on our initial efforts of engineering students doing projects in developing communities—a unique strength of our college.

STRATEGIC RESOURCE PLANNING

Dean Robert Davis set aside his presentation on selected goals from the recently completed Strategic Plan, and the resource needs associated with these goals, due to lack of time. The slides associated with this subject were included with the meeting materials.

EAC BUSINESS MEETING

Dean Davis opened the business meeting by noting that the EAC Vice Chair, David Weiss, has chosen to not stand for election as EAC Chair. The EAC Executive Committee supports the recommendations that George Sissel’s term as EAC Chair be extended one more year, through 6/30/05, to provide continuity, and that Peter Mannetti serve a one-year term as EAC Vice Chair and be considered Chair Elect to succeed

George Sissel. These recommendations were passed by acclamation of the EAC members.

George Sissel then announced that the following new members were elected to the EAC earlier in the day by the Executive Committee:

Jean Becker (in attendance): McDATA Corp.
Scott Donnelly: General Electric
Frank Figueroa: Sandia National Labs
Mike Herriage (in attendance): Northrop Grumman
Betty Irvine: Retired Portola Valley town Engineer

Members leaving the EAC are Bill Coleman, Bill Richardson, and Linda Capuano. They were thanked in absentia (Linda had been present earlier in the day but had to leave for an afternoon meeting). Members continuing for a second term are Kay Gilles, Gary Jacobs, and Fred Kitson. Art Dawson will remain on the EAC for one more year, as immediate Past Chair.

GORDON PRIZE TALK

Professor Frank Barnes made remarks on the Interdisciplinary Telecommunications Program and how it was the first of its kind to include both technical and policy issues. The program has spawned many other telecommunications programs around the country, and its graduates are leaders in academia, government and industry. Frank won the 2004 Bernard M. Gordon Prize from the National Academy of Engineering for his innovation in engineering education and founding of the Interdisciplinary Telecommunications Program. A substantial portion of the \$500,000 prize money is being used by Frank to seed efforts of other faculty members in educational innovation, such as importing and exporting courses with other universities.

RDC REPORT

Gary Anderson, Chair of the Resource Development Committee, gave a summary of the RDC meeting that was just completed. The focus of the RDC for the next six months is to complete the first stage of fundraising for the Earn-learn Program. The goal is to raise \$175,000 from companies. A list of 29 corporate contacts was generated by the RDC, and EAC members were encouraged to add more. A list of 72 individual alumni known by RDC members was also generated, for personal follow-up and invitations to participate in supporting the Earn-learn Program.

Dean Davis noted that a long-term goal for the Earn-learn program is to have sufficient funds for about 300 students (or 10% of the total) to participate each year. At \$1500 per student per year (plus 1:1 department matches), the annual need would be \$450,000—or half that amount if each of the 300 students was an Earn-learn Apprentice for one semester. An endowment of \$10 million would be required to provide an annual distribution of \$450,000. Gary Anderson also reported that the RDC selected Engineering for Developing Communities as its focus area for next year.

WRAP UP & FUTURE ITEMS

Dean Davis reported that the EAC/RDC meeting for next fall is scheduled for 8 October 2004 and that the meeting for next spring will be either 15 or 22 April 2005 (since the meeting, 22 April has been selected). Suggestions for the next meeting include inviting a state legislator or staff member to speak on budget issues and higher education, examining how companies can help with state and federal lobbying issues, and discussing (with both EAC and RDC) how technology transfer might provide more resources.

IN ATTENDANCE

EAC Members: Linda Capuano, Kevin Coyne, Art Dawson, Charlotte Field, Kay Gilles, Gary Jacobs, Ray Kolibaba, Bob Krebs, Jon Liebman, Peter Mannetti, Tom Marsh, Vern Norviel, Chuck Robertson, Kristy Schloss, George Sissel, Jill Tietjen, Jim Voss

RDC Members: Enid Ablowitz, Gary Anderson, Duane Chesley, Mike Davis, Lanny Pinchuk, David Richmond, Al Sanders, Con Sawyer, Greg Smith

Guests: Jean Becker, Mike Herriage