

CECS Planning Initiatives for 2008-2009
February 25, 2008 - Revised

California State University, Northridge
ACADEMIC AFFAIRS

College Planning Initiatives Request Form

INTRODUCTION

This form, which is one of two that Academic Affairs units will complete, consists of a series of questions that you complete for the whole college. It is not necessary to mention all that you are doing; rather, give an overview of major (or groups of) initiatives you propose to achieve during the next year. Indicate, too, partnerships with other colleges/divisions. ***Limit your responses on each page to ONE page; 10 pt. type is recommended.***

The second form that Academic Affairs units should complete asks you to specify the proposed costs of your initiative(s), with shared values (AQ, SE, SV) and priorities (high, middle, low) indicated for each cost category. In *Total Cost* include the complete cost of the item; under *College* put the costs that your unit will pick up. Your General Fund “guess-timated” allocations are at the very top. Be reasonable; and include under *Total Cost* and then *College* items that, individually or grouped, make up initiatives that the College is funding entirely. Use the *Comments* box sparingly; but, where relevant, use it to explain who is sharing the *Total Cost* of particular items/initiatives.

Final forms are due in the Provost’s Office by **February 29, 2008**

College Planning Initiatives 2008-2009 Request Form Revision

February 25, 2008

College:

College of Engineering and Computer Science

Planning Coordinator:

Diane Schwartz --Chair, College Planning Committee

1. Briefly explain how your plans relate to your college's mission/vision.

College of Engineering and Computer Science Mission Statement

The College of Engineering and Computer Science seeks to be a recognized center for excellence for baccalaureate and masters education in computer science and in engineering. The College provides a quality education for its students. It is also a partner in the professional communities of computer science and engineering and provides an essential link between students' education and professional practice.

CECS provides a quality education for its students by developing effective academic programs that prepare students for engineering and computer science careers. To do this we need to continually update and develop our academic programs; develop new ways of teaching our courses that meet the needs of our students; maintain our ABET program accreditations; ensure that our students get good advisement so that they can proceed to graduation in a timely manner; and to provide excellent engineering and computer science laboratories for our students. In 2008-2009 CECS plans to develop, implement and/or market new engineering and computer science degree programs; to increase the number of on-line or hybrid sections and courses offered; to develop a long-range plan to continually replace CECS laboratory equipment as it ages and before it becomes obsolete; and to assess and improve the level and characteristics of technical support staffing needed to maintain the laboratories.

CECS forges partnerships with industry to help provide that essential link between students' education and professional practice. In 2008-2009 CECS plans to increase the number of joint projects (e.g., design clinics) among students, faculty and industry. These projects are funded by industry and allow students to work on industrial problems while being supervised by a faculty member. CECS will also work with industry and others to increase the number of scholarships that are available for our students.

CECS seeks to be recognized as a center for excellence for baccalaureate and masters education. In 2008-2009 CECS plans to focus on outreach and recruitment to ensure that students recognize the value of coming to CSUN for their engineering and computer science education. To support this focus on outreach and recruitment CECS plans to create a Student Ambassadors program and to expand its high school outreach program, ACCESS (Accelerated Coursework in Computer Science and Engineering for Student Success). To further enhance the reputation of the College, CECS will seek to increase research activities in the college. The College will seek to increase the number of research grants that are submitted and funded; will support a College Research Fellow; and will continue to provide reassign time for new probationary faculty for research, as well as travel funds for faculty to attend workshops and conferences. The College will seek funding for the Center for Energy Research and will continue to develop the Ernie Schaeffer Center for Innovation and Entrepreneurship.

2. ACADEMIC QUALITY

a) Assessment

Explain how the college intends to assess the outcomes of the planning initiatives: setting benchmarks, assessing against them, using results, etc.

Assessment of College Planning Initiatives

In fall 2006 the College of Engineering and Computer Science established a set of nine college goals to support the college mission statement and selected the following three goals as its top priorities:

- I. **Student Quality, Recruitment and Retention:** To attract and retain a highly motivated, academically talented, and diverse student population for the undergraduate and graduate programs.
- II. **Faculty and Staff Development:**
 - a. To maintain the currency, motivation, capabilities, and productivity of College faculty so that they may (1) fulfill their roles as teachers and scholars, and (2) provide service to the University and the community.
 - b. To maintain the currency, motivation, capabilities, and productivity of College staff so that they may fulfill their responsibility to provide support for the College's academic programs.
- III. **Curriculum Development:** To provide programs in the College that are attractive to students, support the needs of employers in these fields, and provide a sound basis for the lifelong learning that is essential to an effective career.

Each of the proposed initiatives for 2008-2009 will be assessed as to how it furthered one or more of these top priority goals. In spring 2008 we will establish benchmarks with baseline data for each initiative. At the end of the 2008-2009 academic year the Associate Dean's Office will collect and compile the initiative assessment data. In fall 2009 the assessment results will then be reviewed and evaluated by various committees and units in the college (e.g., Academic Affairs Committee, Student Affairs Committee, Student Services Center, Industrial Advisory Board) and then finally reviewed by the CECS Planning Committee. The results of the assessment evaluation will be reported to the College along with recommendations for actions. These recommendations should feed into our planning initiatives for future years.

Program Assessment for ABET

Assessment is an integral process for improving programs in our college. All of the departments in our college have implemented a process to assess student learning outcomes that meets the requirements for ABET accreditation. ABET requires that we assess the programs using direct evidence of student learning. Each of these programs prepared an extensive ABET assessment report in spring 2007. Each program was evaluated by ABET in October 2007. The preliminary results of the ABET evaluators were positive. The final ABET report will not be issued until August 2008. The Construction Management Technology program is new and is preparing for an accreditation evaluation for next year.

The basic assessment processes used by the departments include senior exit surveys, state exams, alumni and employer surveys, embedded questions on exams, department tests for specific outcomes, independent assessment of student work, pre-requisite tests and mapping scores on test and homework problems to student learning outcomes.

An important part of the ABET assessment process is "closing the loop"; we need to show how the results of our assessment are used and by whom they are used. We need to document any program improvements that result from the assessment process. A few examples showing how the CECS programs "closed the loop" in recent assessment efforts follow. It should be noted that these examples are only illustrative of assessment work that was done and that, while the ABET assessment process is long and arduous, the programs value and use the assessment results.

From their student and employer surveys and faculty discussions, the Computer Science Department found that there was a need to provide more courses related to software engineering and new technologies. They addressed this problem by adding several new senior /graduate level electives to the program. The department assessed the writing and oral communications skills of its students in a required senior level course. The findings showed that the average student had good written communication skills but they also detected two incidents of plagiarism. A new plagiarism policy was presented to the department for discussion; comments were taken and it is being revised for a department vote in spring 2008. The oral communication skills were assessed as satisfactory for most of the students. However about twenty percent of the students did not perform as well as expected and the department will put more emphasis on teaching students how to make more effective oral presentations.

The Mechanical Engineering Department assessed the abilities of their students to apply their knowledge of mathematics, science and engineering. They used course assessment, the national EBI alumni survey, a senior design student assessment and an industry panel evaluation of student design presentations. Using the results of these assessments, the Department found that the students' abilities to apply mathematics, science and engineering to be satisfactory with one exception. The 2005 and 2006 EBI survey showed that their alumni did not give a high evaluation to their mathematics preparation at CSUN. The Department and College plans to initiate a discussion with the Mathematics Department to revise Math 280 to better meet the engineering student needs.

Other examples of program improvements that resulted from the assessment include implementing mandatory advisement (Civil Engineering and Manufacturing Systems Engineering), modification of lower division course objectives to include more software engineering topics (Computer Science), addition of 3 new courses in ASIC/DSP and lab renovations (ECE), more uniform coverage of PSpice and MATLAB (ECE), a new lower division design course (Mechanical Engineering) and improving delivery and consistency in two courses (MSEM).

2. ACADEMIC QUALITY *(continued)*

b) The Learning-Centered University

CSUN faculty and staff have developed pedagogies and learning objectives that take into account the different ways and paces by which students learn, as well as the different media and formats that suit different disciplines and levels of instruction. Recently, we have especially encouraged the replacement of seat time—hours as a measure of learning—with indices and supplementary experiences which allow students to proceed faster, if they can. Record the major ways in which the college has implemented—and will implement—several principles of a learning-centered and/or innovative university. Indicate, too, the extent to which funds have been redeployed to these ends.

The undergraduate programs in the College of Engineering and Computer Science are laboratory-based programs that use student team projects and other practical experiences to complement theoretical components of the curriculum. The curriculum is delivered in many different formats, including lectures, labs, team projects, senior design projects and student presentations. The engineering senior design students typically participate in intercollegiate competitions and/or work with industry sponsors. The Honors Co-op program and department internship programs provide students with further opportunities to “learn while doing”.

Students learn more when they can collaborate with and support each other. To this end the College works closely with a Living Learning Community of 20-30 engineering and computer science students in the Residence Halls. The College also runs an extensive tutoring program in the CECS Student Services Center to tutor CECS students in the lower division math, science, engineering and computer science courses. The College established a college-wide open computing lab in fall 2007 where students may use the computers to work on individual or team projects.

A major recent thrust of the college is the development of on-line or hybrid (a mix of on-line and in-class) courses. The MS in Engineering Management program is offered entirely on-line through the Tseng College of Extended Learning. Faculty and staff are assessing and continuing the development of on-line courses and remote learning through the use of newer technologies such as WebCT, Moodle, other Learning Management Systems, Elluminate and Remote Graphics Systems.

Planned Initiatives for 2008-2009

CECS will continue to help recruit students into the Engineering and Computer Science Living Learning Community and will continue to support the Facilitated Academic Workshops (FAW) and the peer tutoring program. CECS plans to increase the number of on-line or hybrid courses/sections (GE and major courses) offered in the College. The College also plans to increase the number of design clinics and other industrial-supported projects with the goal of increasing the number of students who participate in these projects.

ACADEMIC QUALITY *(continued)*

c) **Research and Creative Activity**

Colleges and other units should report initiatives that will: (1) “incentivize” research, (2) require matches, in-kind support, or enhancements to facilities, (3) respond to regional needs, (4) revamp the delivery of the curriculum and/or the involvement of students as research/creative apprentices, and (5) or require reforms in RPT that, for instance, clarify the standards for early promotion and specify how alternatives to publication will be appraised. (6) Pay special attention to opportunities, through grants and contracts, to enhance the General Fund support of units and the total compensation of faculty.

During the past year the primary college initiatives to “incentivize” research have been to provide reassign time to new probationary faculty for research, to provide travel funds for faculty to attend workshops and conferences and to create or expand College Centers (e.g., Energy Research Center, Ernie Schaeffer Center for Innovation and Entrepreneurship, Center for Research and Services) to provide a focus for research efforts and grant opportunities. Undergraduate and graduate research programs and the needed laboratory infrastructure are enhanced and supported by faculty grant proposals, design clinics and support from industry.

Planned Initiatives for 2008-2009

CECS will continue to provide reassign time to new probationary faculty for research and to fund faculty travel to conferences and workshops. CECS plans to increase the number of research grant proposals submitted by faculty to both campus and to outside funding sources and to increase the number of design clinics supported by industry. The College will also pursue additional funding for the Energy Research Center and will continue to develop the Ernie Schaeffer Center for Innovation and Entrepreneurship. The College will hire a half- time staff person for the Center for Research and Services.

The College, in a funding partnership with the University, will fund a College Research Fellow for 2008-2009.

ACADEMIC QUALITY *(continued)*

d) On-Going Programs

What changes do you anticipate? In particular, how will change to existing programs support growth and quality improvement? How will the proposed change be supported: with new and/or repurposed resources? Will it entail experiential learning, reduce seat time, reinforce GE, and/or respond to regional needs or accreditation reviews? Will it reflect an entrepreneurial direction to enhance General Fund and total compensation?

To respond to changing workforce needs and to provide enrollment growth in the college, CECS started a new MS in Software Engineering program in fall 2007 and is in various stages of development of four other new degree programs: BS in Engineering Management, BS in Information Technology, MS in Structural Engineering and MS in Computer Engineering. A Certificate Program in Quality Management, offered by MSEM in collaboration with the College of Business and Economics, was approved by the campus to begin in fall 2008.

The MS in Software Engineering program expects that the number of majors in the program will grow to 70 by 2011. Some of these majors will be students who are in or would have been in the current MS in Computer Science program. The bulk remainder of the majors will be students that the department attracts from local industry. The small net gain in students will not be a resource drain on the College because of the recent decreases in the number of undergraduate majors in Computer Science. The depth of the faculty expertise in software engineering is strong; there are 7 faculty who regularly teaching software engineering-related courses in the department.

The MS in Structural Engineering will replace the MS in Engineering with an Option in Structural Engineering and is not expected to need additional resources. The MS in Structural Engineering has not yet been approved by GSC.

The Certificate in Quality Management program should enroll an average of 20 part-time students per semester through Open University. Certificate students will enroll in regularly scheduled courses and no special course sections for the certificate students will be offered.

The BS in Engineering Management was approved by EPC in fall 2007 and will be submitted for Chancellor's Office approval in spring 2008 and is expected to be approved for a fall 2008 start. Because the program has been structured almost exclusively from existing courses, the start-up costs for the program are effectively limited to incremental enrollments in the courses. The number of majors in the program is expected to increase by about 20- 30 majors per year.

The BS in Information Technology and the MS in Computer Engineering programs are still being developed in their departments. Market studies will be done in the future.

Changes in existing academic programs also include increasing the number of internship experiences for undergraduates, providing more on-line courses, developing new courses to teach new and emerging technologies and repurposing laboratories to enable more student collaborative experiences and to improve utilization.

Assessment is an integral part of the process of improving programs in the College. The academic departments in the College of Engineering and Computer Science have implemented assessment processes to measure the student learning objectives and outcomes of their engineering and computer science programs. These assessment processes meet the accreditation requirements of the Accreditation Board for Engineering and Technology (ABET). Assessment is on-going and continuous between ABET accreditation 6-year visits and requires extraordinary efforts from the faculty and the staff.

Planned Initiatives for 2008-2009

Six of the bachelor's degree programs in CECS are undergoing ABET accreditation in 2007-2008. Any changes dictated by the ABET review will be implemented in 2008-2009.

CECS will market and/or implement the recently approved new degree programs in the College with the intention of increasing the number of students in these programs. A proposal for an MS in Computer Engineering is being developed.

CECS is an equipment intensive college and it needs to have a stable funding source for replacing obsolete and dysfunctional laboratory equipment in the future. In 2008-2009 CECS will develop a college-wide long-term plan for obtaining major funding for replacing equipment in CECS laboratories and CECS technical infrastructure.

The ABET evaluators (October 2007) found potentially unsafe conditions in the supervision of activities in some of the laboratories and found that the overall level of technical support in the college needs to be increased. To address these concerns CECS will review the level and characteristics of technical support staffing (Information Systems and Technical Services) in the college to make recommendations on the need for changes in the number of technical personnel, the management of the technical personnel and/or in the scope of the work that they are asked to do and then will implement the recommendations as soon as possible.

CECS departments will carry out their ABET approved assessment activities for the 2008-2009 academic year.

3. Student Engagement

Describe how your unit will contribute to the CSUN effort to engage, retain, stimulate, and graduate its students. Specifically, concentrate on plans to improve first to second year retention, reach out to K-12 pupils and teachers, make advising more consistent in practice and policy, and improve the support structures for students in courses with high failure rates. Finally, if pertinent, describe plans to mentor and channel undergraduates into post-baccalaureate study.

The College of Engineering and Computer Science has a strong on-going commitment to student recruitment and to the retention of our students once they matriculate at CSUN. As an example of its commitment to student recruitment, CECS implemented a High School Outreach Program (ACCESS) in fall 2007 whereby 72 students from local high schools took the engineering orientation course, MSE 101/101L, as a hybrid on-line course. The lecture portion of the course was delivered on-line by a CSUN faculty member. The laboratory portion of the course was team-taught with the teachers in the high school. The ACCESS program is designed to give high school students a college experience and to encourage students to consider a major in a technical (STEM) field.

The primary activities in CECS devoted to retention are college-wide efforts to maintain and improve an excellent advisement system (both in the SSC and in the departments); to run the Student Services Center tutorial programs which feature organized group study sessions; to continue the Facilitated Academic Workshop (FAW) program for lower division courses with high failure rates; and to offer a new college-wide orientation course (CECS 196ACT). We also have an Engineering and Computer Science Living Learning Community in the Residence Halls for which CECS provides advisement support, tutoring in lower division CECS major courses and guest speakers.

Another example of student engagement is the strong commitment of the college and departments to student clubs. Each department has at least one active student professional club. These student groups along with the student groups from the Society of Women Engineers (SWE), the Society of Hispanic Professional Engineers (SHPE) and the National Society of Black Engineers (NSBE) support outreach, retention and professional development efforts in the college. They are an important component of the CECS major experience and of college outreach activities.

Planned Initiatives for 2008-2009

In addition to the on-going activities described above, CECS plans to expand the ACCESS program to include additional high schools and possibly one additional course offered to the high schools through distance learning. The College plans to organize a Student Ambassador program to train and utilize CECS students to participate in outreach and recruitment activities. The College will hire a full-time student services professional to help with the college outreach efforts.

CECS is collaborating with the College of Education, College of Science and Math and with Student Outreach and Recruitment (SOAR) in its efforts to expand the ACCESS program. There was a meeting in January 2008 with the LAUSD high school principals to introduce the principals to CECS programs and to the ACCESS program. This meeting was arranged by Dean Rusche. At that meeting a representative from SOAR gave an overview of CSUN Academic Development Programs. CECS met with Javier Hernandez from SOAR in fall 2007 to exchange ideas on how best to expand the engineering pipeline from K-12 to college to the workforce through outreach programs like ACCESS. The Engineering Academy Advisory Group (for ACCESS) is consists of faculty and staff from the Colleges of Education, Science and Math, and Engineering and Computer Science.

We met with the Director of the Developmental Math Program and the Coordinator of the Early Assessment Program in the College of Education to discuss points of connection between the ACCESS program and EAP and the Math Initiative (MSTI) program. Outreach efforts in engineering and computer science, particularly in the area of robotics, should complement some of the activities in the MSTI program.

The College will also seek to increase the CECS scholarship endowments.

4. SHARED VALUES

Discuss how proposed initiatives reflect the shared values of the university and your college's core values. What philosophy—what thread—ties together these efforts? Indicate how they respond to assessment reports

The College is committed to excellence in teaching and scholarship. We value the quality of our educational programs and the quality of our faculty and staff and we value our students. Graduates of our programs should be of the highest quality and should be sought after by employers. Our students should have the skills needed to make innovative contributions to their field, to be leaders in their field and to be life-long learners. Our faculty and staff need to maintain professional currency; our faculty needs to have the time for scholarly and creative activity that contributes to the excellence of their teaching and to the recognition of the excellence of our programs.

The College values a diverse student body and works with the local community to create a pipeline of diverse students to college and to careers in engineering and computer science.

The College values its partnerships with industry. Industry provides support and opportunities for faculty and students to keep abreast of ever-changing technology fields. Industry partnerships, such as the Honors Co-op and design clinics, give students the opportunities to get professional experience while they are still in school. Industry partnerships help the College maintain its very expensive laboratories.

Each of the proposed planning initiatives for 2008-2009 reflects one or more of these shared values. The proposed initiatives fall into three major categories: (1) improving the excellence of our academic programs (curriculum, research, laboratories); (2) forging partnerships with industry to enhance our programs and to provide students with practical, real-world experiences; (3) outreach and recruitment activities to create a pipeline of diverse students to the college and to careers in engineering and computer science.

Professional accreditation of our undergraduate engineering and computer science programs is of the utmost importance to the College. All of our undergraduate programs are ABET accredited or applying for ABET or ACCE (American Council for Construction Education) accreditation. The following initiatives proposed for 2008-2009 are a direct or indirect result of the ABET assessment reports from spring 2007 and the ABET evaluation team visits in October 2007:

- Implement curriculum changes required by ABET.
- Implement improvements needed in the assessment process.
- Increase technical staff support in laboratories.
- Increase the number of opportunities for students to work on industry-related projects.
- Increase the number of enrollments in the CECS programs by enhancing our outreach programs and creating new programs and course delivery methods for existing programs.

**Addendum: Summary of CECS Planning Initiatives for 2008-2009
February 25, 2008**

The following table describes how the College will assess a selected subset of its new planning initiatives for 2008-2009.

Goal acronyms (See Planning Document)
 SQRR – Student Quality, Retention and Recruitment
 FACDEV – Faculty Development
 STAFFDEV – Staff Development
 CURR - Curriculum Development

	Initiative (Goal)	Benchmarks	Assessment Process	Responsibility for the Review (R)and Evaluation (E) of Assessment Results
1	Increase the number of and enrollments in online or hybrid sections, courses or programs (SQRR)	Number of and enrollments in online or hybrid sections, courses or programs	Verify enrollments in these courses or programs	Academic Affairs (E); Planning Committee (R)
2	Increase the number of design clinics, Honors Coop or other industrial supported projects funded (SQRR)	Number of design clinics or other projects funded; Number of students involved in design clinics or funded projects; \$ size of funded projects	Verify numbers with departments and Center for Research and Services	CRS (E); Planning Committee (R)and IAB(R)
3	Expand and enhance High School Outreach Program (SQRR)	Number of CECS courses taught in ACCESS Program; Number of students and schools participating	Verify with faculty and SSC	Academic Affairs (E); SSC(E); Planning Committee(R)
4	Organize and implement a CECS Student Ambassador program (SQRR)	Number of student ambassadors; Number of outreach and recruitment events they participate in	Verify with Associate Dean and SSC	Student Affairs (E); SSC(E); Planning Committee(R)
5	Seek funding Ernie Schaeffer Center for Innovation and Entrepreneurship (SQRR)	Additional funding secured; Number of students involved in entrepreneurial projects	Report from the Center	CRS(E); Development Office(E); Planning Committee (R)
6	Increase CECS scholarship endowments (SQRR)	Increase in funding for scholarships; Number of new scholarships	Verify with CECS Development Office	Student Affairs (E); Development Office(E); Planning Committee(R)

7	Select and support a College Research Fellow (FACDEV)	Results of the research including publications, conferences and presentations	Required report from Research Fellow	Research Fellow Selection Committee(E); Planning Committee (R)
8	Increase the number of research grant proposals submitted (FACDEV)	Number of research grant proposals submitted; Number of funded proposals; \$ size of funded proposals	Verify numbers with departments and Research and Sponsored Projects and Foundation	Academic Affairs (E); Planning Committee (R)
9	Seek funding for the Center for Energy Research (FACDEV)	Additional funding secured; Number and size of new projects in the Center	Report from the Center	CRS(E); Development Office(E); Planning Committee (R)
10	Review the level and characteristics of technical support needed in the College and make recommendations for needed changes. Implement recommendations by end of 2008-2009 (STAFFDEV)	Recommendations are feasible and broadly acceptable to the College and are implemented	Review the recommendations/ implementations	IT and Tech Shop(E); Departments(E); Planning Committee (R); Administrative Council(R)
11	Market and/or implement recently approved degree programs (CURRDEV)	Number of students/ enrollments in the new programs; program FTES	Verify with departments and A&R	Academic Affairs (E); Departments(E); Planning Committee (R)
12	Develop and/or seek approval of new degree programs (CURRDEV)	Number of new programs approved	Verify with departments	Academic Affairs (E); Departments(E); Planning Committee (R)
13	Carry out continuous program assessment as required by ABET; write ABET assessment plans for 2009-2010 (CURRDEV)	Did the departments meet the requirements of their 2008-2009 ABET assessment plans?	Verify assessment activities with Assessment Liaison Committee	College Assessment Committee(E); Departments (E); Planning Committee (R)
14	Implement any curricular or assessment process changes required by ABET (CURRDEV)	Changes implemented	Verify with departments	Academic Affairs (E); Planning Committee (R); IAB (R)
15	Develop a long-range plan to continually replace aging /obsolete equipment in college (CURRDEV)	Plan is comprehensive and is feasible	Review long-term equipment funding plan	Departments (E); IT and Tech Shop(E); Planning Committee(R)