I. Minutes: none.

II. Communications and Announcements:

III. Reports:
A. Academic Senate Chair:
B. President’s Office:
C. Provost’s Office:
D. Statewide Senators:
E. CFA Campus President:
F. ASI Representatives:
G. Other:

[February 12] Jacquelyn Kegley, Chair of the CSU Academic Senate, will be speaking on Shared Governance.

[February 19, time certain 4:45pm] Luanne Fose will give a short presentation on “My Blackboard” (computing media program).

IV. Consent Agenda:

V. Business Items:
A. Resolution on Budget Principles and Strategies: Greenwald, for Budget & Long Range Planning Committee, second reading (pp. 2-7).

B. Resolution on Distance Education Policy: Hannings, chair of the Curriculum Committee, second reading (pp. 8-15).

C. Curriculum Proposal for BS in Software Engineering: Hannings, chair of the Curriculum Committee, first reading (pp. 16-21).

D. Resolution on Academic Integrity, Program Accountability, and 180 Units for Degree: Hannings, chair of the Curriculum Committee, first reading (pp. 22-23).

E. Resolution on Process for Change of Major: Breitenbach, chair of the Instruction Committee, first reading (pp. 24-27).

VI. Discussion Item(s):

VII. Adjournment:
Background: During the early 1990s the State of California experienced a significant economic downturn. As a result of the economic problems during this period of time, the financial support for the CSU was substantially reduced. Many areas of this campus are still feeling the effects of this reduction in support. The attached Budget Principles and Strategies are an attempt to create strategies for minimizing the impact on Cal Poly resulting from the reduction in support from the state, without significantly affecting the faculty positions required to sustain enrollment. This scenario is especially useful in dealing with a late-in-the-year budget cut.

WHEREAS, The State of California has entered a difficult financial period; and

WHEREAS, The financial difficulties of the state will likely result in a reduction of support for the CSU; and

WHEREAS, The CSU has asked all of the campuses, including Cal Poly, to plan for significant cuts in support; and

WHEREAS, Careful planning will be essential if the campus is to minimize the harmful effects of these budgetary cuts; therefore, be it

RESOLVED: That the Academic Senate urge the Cal Poly administration to include all constituencies in budgetary discussions; and be it further

RESOLVED: That the Academic Senate endorse the attached Budget Principles and Strategies; and be it further

RESOLVED: That the Academic Senate urge the Cal Poly administration to use these Budget Principles and Strategies in the budget process.

Proposed by: Academic Senate Budget and Long Range Planning Committee
Date: December 18, 2001
Revised: February 4, 2002
Budget Principles and Strategies

Principles
- Priority shall be given to maintaining the quality and character of education at Cal Poly.
- Enrollment must be consistent with available resources.
- The University should adhere to an enrollment policy that stabilizes enrollments and minimizes enrollment oscillations.
- The University budgetary process should be open and include all constituencies.
- Faculty, students, and staff are entitled to timely financial information.
- Faculty, students, and staff are entitled to enrollment information that is made available at the time enrollment decisions are made.

Strategies

A. Short-term strategies
- Impose a hiring freeze.
- Defer maintenance.
- Reduce discretionary spending.
- Reduce equipment purchases.
- Defer library acquisitions.
- Reduce or eliminate campus-wide initiatives that are expensive to run and not widely used by faculty or students.
- Reduce or eliminate non-essential non-classroom activities such as non-essential workshops.
- Examine administrative positions, including those that have been added since 1990, to determine whether they are necessary.

B. Longer-term strategies
- Merge colleges.
- Fill openings selectively.
- Redirect resources.
- Delay implementation of the student administration portion of CMS.
- Consider reducing non-essential services.
- Evaluate the resources committed to athletics.
- Eliminate programs.

C. Enrollment and course offering strategies
- Reduce enrollment to match available resources.
- Minimize enrollment oscillations by establishing consistent fall enrollments.
- If necessary, reduce the number of new students admitted in other quarters.
- Try to maintain as many teaching positions as possible.
- Explore the possibility of creating a unit maximum for students.
- If consistent with good academic practice, explore reducing the number units required for graduation.
- Consistently apply policy regarding academic disqualifications.
• Synchronize academic disqualification with disqualification with financial aid.
• Examine the scheduling of classes to determine if scheduling conflicts can be reduced.
• Examine the scheduling of classes to determine if the number of non-essential course offerings can be reduced.
• Investigate potential changes in mode of instruction that could lead to efficiencies while preserving academic quality.
• Investigate expansion of international programs.
• Consider possible restrictions on double majors and/or minors.

D. Process
• Reactivate UPBAC and ensure that budgetary decisions are made with input from faculty, students, and staff.
• Schedule a special Senate Executive Committee and/or Senate meeting devoted to the budget.
AMENDMENT PROPOSED BY SENATOR DETURRIS

Adopted:

ACADEMIC SENATE
of
CALIFORNIA POLYTECHNIC STATE UNIVERSITY
San Luis Obispo, CA

AS--____-02/

RESOLUTION ON
BUDGET PRINCIPLES AND STRATEGIES GOALS

Background: During the early 1990s the State of California experienced a significant economic downturn. As a result of the economic problems during this period of time, the financial support for the CSU was substantially reduced. Many areas of this campus are still feeling the effects of this reduction in support. The attached Budget Principles and Strategies Goals are an attempt to create strategies for minimizing the impact on Cal Poly resulting from the reduction in support from the state, without significantly affecting the faculty positions required to sustain enrollment. This scenario is especially useful in dealing with a late-in-the-year budget cut.

WHEREAS, The State of California has entered a difficult financial period; and

WHEREAS, The financial difficulties of the state will likely result in a reduction of support for the CSU; and

WHEREAS, The CSU has asked all of the campuses, including Cal Poly, to plan for significant cuts in support; and

WHEREAS, Careful planning will be essential if the campus is to minimize the harmful effects of these budgetary cuts; therefore, be it

RESOLVED: That the Academic Senate urge the Cal Poly administration to include all constituencies in budgetary discussions; and be it further

RESOLVED: That the Academic Senate endorse the attached Budget Principles and Strategies Goals; and be it further

RESOLVED: That the Academic Senate urge the Cal Poly administration to use these Budget Principles and Strategies Goals in the budget process.

Proposed on February 4, 2002 by Dianne DeTurris (senator, CENG) to the Academic Senate Budget and Long Range Planning Committee Resolution dated December 18, 2001 (Revised: February 4, 2002)
Budget Principles and Strategies Goals

Principles
- Priority shall be given to maintaining the quality and character of education at Cal Poly.
- Enrollment must be consistent with available resources.
- Priority should be given to recruiting and retaining quality faculty and staff.
- Changes in state support should not significantly affect the faculty positions required to sustain enrollment.
- The University should adhere to an enrollment policy that stabilizes enrollments and minimizes enrollment oscillations.
- The University budgetary process should be open and include all constituencies.
- Faculty, students, and staff are entitled to timely financial information.
- Faculty, students, and staff are entitled to enrollment information that is made available at the time enrollment decisions are made.

Strategies

A. Short-term strategies
- Impose a hiring freeze.
- Deferral of maintenance.
- Reduction of discretionary spending.
- Reduction of equipment purchases.
- Deferral of library acquisitions.
- Reduction or elimination of campus-wide initiatives that are expensive to run and not widely used by faculty or students.
- Reduction or elimination of non-essential non-classroom activities such as non-essential workshops.
- Examine administrative positions, including those that have been added since 1990, to determine whether they are necessary.

B. Longer-term strategies
- Merge colleges.
- Fill openings selectively.
- Redirect resources.
- Delay implementation of the student administration portion of CMS.
- Consider reducing non-essential services.
- Evaluate the resources committed to athletics.
- Eliminate programs.

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- Reduction of enrollment to match available resources.
- Minimize enrollment oscillations by establishing consistent fall enrollments.
- If necessary, reduce the number of new students admitted in other quarters.
- Try to maintain as many teaching positions as possible.
- Explore the possibility of creating a unit maximum for students.
• If consistent with good academic practice, explore reducing the number of units required for graduation.
• Consistently apply policy regarding academic disqualifications.
• Synchronize academic disqualification with disqualification with financial aid.
• Examine the scheduling of classes to determine if scheduling conflicts can be reduced.
• Examine the scheduling of classes to determine if the number of non-essential course offerings can be reduced.
• Investigate potential changes in mode of instruction that could lead to efficiencies while preserving academic quality.
• Investigate expansion of international programs.
• Consider possible restrictions on double-majors and/or minors.

D. Process
• Reactivate UPBAC and ensure that budgetary decisions are made with input from faculty, students, and staff.
• Schedule a special Senate Executive Committee and/or Senate meeting devoted to the budget.
WHEREAS, Distance education has become an accepted form of teaching; and
WHEREAS, Some courses and programs at Cal Poly are using distance education as a teaching tool while Cal Poly has no approved distance education policy; and
WHEREAS, The Academic Senate Curriculum Committee and the Instructional Advisory Committee on Computing have approved the attached policy entitled Distance Education Policy at Cal Poly, San Luis Obispo; therefore, be it
RESOLVED: That the Academic Senate adopt the attached Distance Education Policy at Cal Poly, San Luis Obispo document.
Preamble

This policy is designed to be a guide for those faculty who plan to use distance education (DE). Cal Poly will continue to encourage responsible innovation in teaching, embracing experimentation whose goal is to improve the quality of education. While Cal Poly should remain receptive to innovative forms of teaching such as distance education, the University must also ensure that there is proper oversight and review to uphold the standards of quality already established at Cal Poly. The basic principle is that best teaching/learning practices will drive the technology that will be considered and used in the curriculum. We must continually discuss and address the questions:

- How can information technology assist Cal Poly to gain/preserve what it most wants/needs in order to be true to its mission and identity?
- How can information technology help Cal Poly not lose what it most needs and wants?
- How can information technology strengthen Cal Poly's core institutional characteristics, such as: polytechnic, "learn by doing," undergraduate focus, teaching emphasis, residential, competitive admission, statewide service area, and graduates who are competent and employable on graduation?

At Cal Poly, we have placed considerable emphasis on securing up-to-date information technology for students and faculty. However, as I and Provost Paul Zingg have stated clearly on previous occasions, we embrace this technology primarily as a means to enhance teaching and learning on our campus. We want teachers and learners to have access to the burgeoning Internet resources, to be able to contact the library and other information sources 24 hours a day, and to be able to use the revolutionary software and Web products that serve as important educational tools. This technology is not intended to provide impetus that will transform Cal Poly into a "virtual university," offering a large number of courses on-line or through telecommunications networks to our core student body.

We should keep in mind, however, that these resources may offer opportunities to bring our special expertise to practicing professionals with continuing education needs and perhaps even enhance funding for our academic departments. At the same time it should be noted that any expansion in distance learning will be determined by faculty and departments, and this activity will not
be allowed to impact the quality or kind of learning on which our reputation is based.

Yes, like the solo bowler, some of our students, out of choice or circumstance, will learn alone. The new information technologies increasingly available to them and us means that we can accommodate them more readily. I urge, though, that no matter which learners we serve or what technologies we employ, we explicitly aim to foster collaborative learning, social discourse, and other attributes of effective learning communities.
—Paul Zingg, “Learning Alone Should Not Mean Learning Apart”

**Definition**

Technology Mediated Instruction (TMI) is defined by the Academic Senate of the California State University as “all forms of instruction that are enhanced by or utilize electronic and/or computer-based technology. It specifically includes distance education, instructional modules delivered via mass media, and computer assisted instruction” (AS-2321-96). This policy focuses on the Distance Education component of Technology Mediated Instruction, referred to here as DE, in which some students are geographically separated from the instructor while classes are being conducted. (See S and A Below)

**Chancellor’s Office Definitions for Academic Planning Data Base (APDB)**

- **F** = Course section is conducted "Face-to-Face," i.e., the students meet with an in-person instructor in a contained space setting.
- **S** = Course is not conducted Face-to-Face, but it occurs at a regular scheduled time, e.g., a televised broadcast. Such a method of instruction is known as "Synchronous" mode.
- **A** = Course is not conducted Face-to-Face and does not occur at a regularly scheduled time, e.g., student self-pace instructional material accessed via the web. Such a method of instruction is known as "Asynchronous" mode.

**Applicability**

This policy shall apply to all new and existing credit-bearing courses and programs offered using DE by Cal Poly, including those offered through the Open University. Any department or faculty group offering DE proposes to initiate a degree programs in which more than half of the units are offered through distance education is expected to meet approval in advance from the Western Association of Schools and Colleges (WASC) is required under the latter’s Substantive Change Policy requirements and be guided by policy established by the University. In addition, a department or faculty group is expected to address, in its self-studies and/or proposals for institutional change, the following policy guidelines, which will be reviewed by the University and
perhaps by the regional accrediting commission. The manner in which it does so will be
reviewed by the University and perhaps by the Western Association of Schools and
Colleges (WASC)*.

* The Western Association of Schools and Colleges (WASC) has developed guidelines
for distance education. The guidelines are an extension of the Principles developed by the
Western Interstate Commission for Higher Education. The Cal Poly policy outlined
above reflects many of the WASC guidelines set forth as of 03/08/00. The language used
in the WASC guidelines set forth as of 3/8/00 has been incorporated into this policy,
when deemed appropriate, but has been adapted to reflect conditions at this University.
For the text of the WASC guidelines, please refer to the WASC Web-site of WASC at
http://www.wascweb.org/senior/guide/.

Instructional Methods and Academic Responsibility

Cal Poly faculty have final responsibility for determining the pedagogies and
instructional methods most appropriate for the instructional modules, courses, and/or
academic programs which the University offers. Among the factors to be considered in
determining the suitability of a particular course for DE are the following: (a) Does the
use of DE improve the quality of the course? Can it be demonstrated that the use of DE-
in enhancing teaching effectiveness, achieving the desired learning outcomes, suiting
students’ different learning styles, or increasing student access to education?—produces a
course that is at least equivalent in quality to curricular offerings currently approved at
Cal Poly? (b) Does sufficient student demand exist? (c) Are the necessary instructional
and student support resources available to facilitate the use of DE, e.g., (for example,
access to advising and information sources, information technology infrastructure, etc.)?

Quality

While the University prizes academic freedom and wishes to encourage innovation in
instruction, the faculty also have a collective responsibility to ensure the academic quality
and integrity of the University's courses, programs, and degrees. This responsibility
extends to those courses and programs offered using DE. The quality of instructional
modules, courses, and academic programs delivered by or using DE must be at least
equivalent to the quality of curricular offerings currently approved at Cal Poly. The
purposes of DE are to increase the quality of instruction and to increase the access of
students to faculty, to educational resources, and to each other. (For example, there may
be only one expert on a particular subject in the system, and technology can make her
available to all CSU students.) If DE results in increased class sizes or student-faculty
ratios beyond traditional classroom and curricular standards, additional resources or
workload adjustments necessary to maintain the quality of instruction must be provided
in accordance with established collective bargaining agreements the faculty contract. In
some cases, DE may offer the opportunity for cost savings, increased student access, or
other benefits. While these are laudable, care should be taken to ensure that these
advantages do not come at the expense of quality education.
Assessment

Criteria for assessing the quality of technology-mediated instruction shall be developed by the academic units from which the instruction originates. DE courses, sections, and programs shall be held to the same standards as traditional classroom instruction when reviewed by department, college, university curriculum, and program review committees. Any new course that includes, or any existing course being changed to include, a DE component that will replace 33% or more of face-to-face time shall have this indicated on the Course Description form to be reviewed by the curriculum committees as part of the regular curriculum review process. (Face-to-face time is defined as interaction between the instructor and the students, with the instructor present in the same classroom at the same time as the students.) Program Review committees shall evaluate the educational effectiveness of DE programs (including assessments of student-based learning outcomes, student retention, and student satisfaction), and when appropriate, determine comparability to campus-based programs. This process shall also be used to assure the conformity of DE courses and programs to prevailing quality standards in the field of distance and distributed education. DE courses and programs shall be consistent with the educational missions and strategic plans of the Department, College, and University.

Curriculum and Instruction

Each course or program using DE shall provide the opportunity for substantial, personal, and timely interactions between faculty and students, and among students. Interactions may be face-to-face, or via synchronous or asynchronous e-mail or other means.

Tenured or probationary faculty shall direct any culminating experience or capstone of a DE program.

Cal Poly faculty assume responsibility for and exercise oversight over DE courses and programs, ensuring both their rigor and their quality of instruction. This includes:

- Ensuring that standards consistent with established University policies and collective bargaining agreements the contract are followed in setting course loads per instructor, workloads and procedures.
- Selecting and evaluating the faculty who create the courses.
- Maintaining approximately the same ratio of tenured/probationary faculty to adjunct/part-time faculty in DE programs as in campus-based programs.
- Ensuring that the technology used suits the nature and objectives of the courses and program.
Ensuring the currency of materials, courses, and program.

Ensuring the integrity of student work and the credibility of the degrees and credits the University awards. It is the responsibility of the faculty to ensure that reasonable safeguards are in place to prevent academic dishonesty.

**Contracting**

The University shall not agree in a contract with any private or public entity to deliver or receive DE courses or programs for academic credit, or not for credit, without the prior approval of the relevant department and college. Ideally, the impetus for such a contract should originate with the Cal Poly faculty, who would decide whether there is an instructional need and how best to fill it.

**Intellectual Property Rights**

Ownership of materials, faculty compensation, copyright issues, and the use of revenue derived from the creation and production of software, telecourses, or other media products shall be agreed upon by the faculty and the University prior to the initial offering of a DE course or program, in accordance with established CSU and Cal Poly policies.

**Resources**

Students shall have adequate access to library resources, and to laboratories, facilities, and equipment appropriate to the DE courses and programs. Students shall have adequate access to the range of student services appropriate to support DE courses and programs, including admissions, financial aid, academic advising, delivery of course materials, and placement and counseling. Students shall be provided with technical advice on how to solve hardware and software problems, and with an adequate means for resolving student complaints.

The University shall offer appropriate training and support services to faculty who teach DE courses and programs through professional development programs, technical support programs, equipment acquisition, library resources, staff resources and development, and the construction of appropriate instructional facilities.

Forms of technology-mediated instruction frequently rely on technology infrastructure (computers, networks, help desk, etc.) that may not be employed in current course delivery at Cal Poly. Therefore, development of an appropriate infrastructure to support DE is a basic university responsibility prior to offering the courses. Needs for enhancement in areas such as access to library resources, information technology, instructional design and technical support, faculty development in the use of DE, computer and network support, and student services should be identified at the
department, college, and university levels. Cross-unit and cross-institutional sharing of learning and resources should be encouraged.

Any DE course or program must receive resource approval from the respective college dean(s) prior to commencing operation; faculty need to make certain they identify their intention and needs with sufficient lead-time to allow administrative units to evaluate whether appropriate infrastructure exists or can be in place prior to the DE offerings.

Admissions

Admissions criteria shall be comparable for students on and off campus. Agencies providing funding for DE courses or programs shall not acquire any privileges regarding the admission standards, academic continuation standards, or degree requirements for students or faculty.

Truth in Advertising

Faculty and students have a right to know the modes of delivery and technological requirements of each course, program, and degree offered by the University. At a minimum, this information will be indicated for DE courses in the schedule booklet each quarter.

Impact on Faculty Personnel Decisions

Faculty personnel decisions (hiring, retention, tenure, promotion, and post-tenure review) should value and reward course and curriculum development and professional development activities that result in improved instruction. However, no ranking of instructional methodologies or modes of delivery is to be used as a basis for personnel decisions. The role and value of DE should be made explicit in the personnel policies of departments and colleges.

(Refer to Faculty Affairs Comm.)

Final Note

Technology mediated instruction is an optional mode of instruction. Nothing in this policy shall imply that DE is a preferred or required mode of instruction.

Implementation of this policy must comply with existing campus policies and collective bargaining agreements where applicable, e.g., workload and faculty rights.

*The Western Association of Schools and Colleges (WASC) has developed guidelines for distance education. The guidelines are an extension of the Principles developed by the Western Interstate Commission for Higher Education. The Cal-Poly policy outlined above reflects many of the WASC guidelines set forth as of 03/08/00. The language used
in the WASC guidelines has been incorporated into this policy, when deemed appropriate, but has been adapted to reflect conditions at this University. For the text of the WASC guidelines, please refer to the Web site of WASC at http://www.wasweb.org/senior/guide/
Summary of the Proposal for a Bachelor of Science in Software Engineering (SE)

Computer Science Department
College of Engineering
California Polytechnic State University
San Luis Obispo

January 19, 2002
1. Title of Proposed Program

Bachelor of Science, Software Engineering

2. Reason for Proposing the Software Engineering Program

The need for engineering practices in software development is widely recognized by the computer industry and by society at large. The proposed program emphasizes engineering methods and the exposure of the students to practical experience in software engineering and team leadership. The B.S. in Software Engineering is a step towards providing the State of California with computer software professionals that can design, develop and deliver computer software systems that are on time, on budget and on target.

The State of Texas already licenses computer software engineers; there is reason to believe that other states, including California, will follow the lead of Texas and make software engineering an engineering profession. It seems prudent for California higher education to prepare for the licensing of computer software engineers.

The Computer Science Department Industrial Advisory Council (IAC) discussed a software engineering program in their 1999/2000 meetings. The IAC strongly endorsed the creation of the program and wrote a white paper in support.

The benefits to the College of Engineering, Cal Poly and the State of California include increased state wide and national visibility for the department confirming its role as a national and regional leader in engineering degree programs.

3. Anticipated Student Demand (if CSC department has no enrollment growth)

The Computer Science department can offer the SE major with no growth in the department’s student enrollment. In that no-growth scenario, the department expects the following student demand for the SE major.

<table>
<thead>
<tr>
<th></th>
<th>At SE initiation</th>
<th>Three years after SE initiation</th>
<th>Five years after SE initiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of SE majors</td>
<td>35</td>
<td>105</td>
<td>150</td>
</tr>
<tr>
<td>Number of SE graduates</td>
<td>10</td>
<td>35</td>
<td>46</td>
</tr>
<tr>
<td>Number of CSC majors</td>
<td>439</td>
<td>369</td>
<td>324</td>
</tr>
<tr>
<td>Number of CPE majors</td>
<td>416</td>
<td>416</td>
<td>416</td>
</tr>
</tbody>
</table>

Expected number of majors in SE, CSC, CPE programs
(assumes zero growth in CSC dept)
4. **Anticipated Student Demand (if CSU department grows by DEPAC projections)**

If the CSU increases department enrollment, additional resources will be required whether the SE program exists or not. The Cal Poly Dean's Enrollment Planning Advisory Committee (DEPAC) has projected a SE enrollment, for the academic year 2009, of 250 students over present department levels. The following table projects SE enrollments for an increase to 250 students by the academic year 2009/10. The table also includes the DEPAC projections for the CSC and CPE programs.

To meet the increased student load five years after SE program initiation, the computer science department would require seven additional people including:
- 5 additional faculty members of whom 2 or 3 would be software engineering specialists.
- 1 additional technical support person
- 1 additional clerical person

<table>
<thead>
<tr>
<th></th>
<th>At SE initiation</th>
<th>Three years after SE initiation</th>
<th>Five years after SE initiation</th>
<th>DEPAC Projection (2009/2010)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of SE majors</td>
<td>35</td>
<td>105</td>
<td>150</td>
<td>250</td>
</tr>
<tr>
<td>Number of SE graduates</td>
<td>10</td>
<td>35</td>
<td>46</td>
<td>60</td>
</tr>
<tr>
<td>Number of CSC majors</td>
<td>474</td>
<td>504</td>
<td>540</td>
<td>590</td>
</tr>
<tr>
<td>Number of CPE majors</td>
<td>416</td>
<td>440</td>
<td>465</td>
<td>490</td>
</tr>
</tbody>
</table>

Expected number of majors in SE, CSC, CPE

(assumes enrollment numbers increase gradually to DEPAC projection levels)

5. **Indicate the kind of resource assessment used in developing the program proposal.** If additional resources will be required, the summary should indicate the extent of department and/or college commitments(s) to allocate them.

The computer science department uses a spreadsheet model to manage and plan resource needs. The model indicates that no new resources are needed to commence the SE degree program. All the needed faculty are already department members. The software engineering laboratories already exist and are used in extant courses.

6. **Describe the library resources needed to support the program, specified by subject area.**

There are already sufficient library resources to support the Software Engineering program. The Science and Technology Reference Department of the Library has a steady budget to support the growing demands of students and faculty. Below are some recent budget figures:
### Budget

<table>
<thead>
<tr>
<th>Description</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Science Book Fund</td>
<td>$4,510.00</td>
</tr>
<tr>
<td>Standing Orders</td>
<td>3,277.00</td>
</tr>
<tr>
<td>Services</td>
<td>2,184.00</td>
</tr>
<tr>
<td>Periodicals</td>
<td>16,950.00</td>
</tr>
<tr>
<td>Total</td>
<td>$26,561.00</td>
</tr>
</tbody>
</table>

The Science and Technology Section Reference Department contains the following volume count:

<table>
<thead>
<tr>
<th>Call Number</th>
<th>Subject Area</th>
<th>Volumes</th>
</tr>
</thead>
<tbody>
<tr>
<td>QA 76</td>
<td>Computer Science</td>
<td>4,043</td>
</tr>
<tr>
<td>QA 76.758</td>
<td>Software Engineering</td>
<td>80</td>
</tr>
<tr>
<td>QA 76.8</td>
<td>Special Computers</td>
<td>390</td>
</tr>
<tr>
<td></td>
<td>Topics</td>
<td></td>
</tr>
</tbody>
</table>

7. **Summarize evidence of need for graduates with this specific education background.**

**Student interest**
In March 2000, a survey was conducted among Computer Engineering, Computer Science and Business majors to determine whether they would be interested in a Software Engineering major. Of the respondents, 37% were “very interested” or “definitely interested” in such a new program. Among the Computer Science majors surveyed, 49% of the respondents expressed a positive interest.

**Graduate surveys**
The 1998 and 1999 Cal Poly graduate status report survey was sent to Computer Science and Computer Engineering graduates. Among the reported data was the job title of the graduate.
Of the returned surveys, 68 (40%) of the respondents had job titles indicating that their primary responsibility was in Software Engineering.

**1999–2000 focus groups**
On February 24, 2000 a focus group session was conducted with corporate recruiters who hire Cal Poly Computer Science graduates. Most of the recruiters were focused on identifying students to fill Software Engineering positions and were generally pleased with the quality of graduates the Cal Poly Software Engineering classes produce. They would like to see these classes expanded to the full range of Software Engineering topics. The SE curriculum specifically addresses these needs.

**New Employment Vacancy Advertisement**
The primary technical employers, for the Computer Science Department, are the technology companies in Silicon Valley.
A random sample, on October 8, 2000, of the San Jose Mercury News identified 31% of all engineering position ads in the Software Engineering area.
8. If the new program is currently a concentration or specialization, include a brief rationale for conversion.

Not applicable

9. If the new program is not commonly offered as a bachelor's or master's degree, provide compelling rationale explaining how the proposed subject area constitutes a coherent, integrated degree major that has potential value for students. If the new program does not appear to conform to the CSU Board of Trustee policy called for "broadly based programs", provide rationale.

Software Engineering is recognized as a distinct engineering profession; SE programs can be accredited by ABET and several states are discussing the licensing of software engineering.

Software Engineering programs are being created at a rapid rate. There are presently 57 such programs with 4000 enrolled students. Dozens of other universities are preparing software engineering program proposals.

10. Briefly describe how the new program fits with the department/college/university strategic plans.

Section 1.8 of Cal Poly's Strategic Plan states:

*Cal Poly's decisions about academic programs and administrative organizations shall be based on the educational needs of students and society and the efficient, effective and appropriate use of resources within a program.*

The State of California faces a critical shortage of trained software engineers. Software systems pervade all parts of our society; software engineers are needed to construct software systems just as trained civil engineers are needed to construct buildings. The Software Engineering program will contribute to the state's need with a minimum of resources. Faculty members who will teach the Software Engineering courses are already hired. The courses exist and have been taught as technical electives in the Computer Science department.

Section 7.2 of Cal Poly's Strategic Plan states:

*Cal Poly shall explore alternative educational models and technologies to enhance the quality and quantity of the services it provides to its students and other constituencies, including business and industry.*

The SE program includes a working relationship with industry. The capstone sequence (CPE 402/405/406) is a partnership between the SE students and corporations who provide course projects. These business partners work with the students regularly to provide assistance, insight and feedback on their progress.

The Cal Poly Dean's Enrollment Planning Advisory Committee (DEPAC) developed a plan for the nature, extent, conditions and timing of undergraduate growth; DEPAC forecasts 250 SE majors by the academic 2009/10.
11. Proposed Curriculum, B. S. in Software Engineering

Total number of units
The SE major requires 198 total units including a strongly advised coop.

Required Major Courses (total units = 95)

- CPE 101 Fundamentals of Computer Science I (4)
- CPE 102 Fundamentals of Computer Science II (4)
- CPE 103 Fundamentals of Computer Science III (4)
- CSC 141 Discrete Structures (4)
- CPE 205 Software Engineering I (4)
- CPE 206 Software Engineering II (4)
- CSC 300 Professional Responsibilities (4)
- CPE 305 Individual Software Design and Development (4)
- CSC 330 Programming Languages (4)
- CSC 349 Design and Analysis of Algorithms (4)
- CPE 353 Computer Systems Programming (4)
- CPE 402 Software Requirements Engineering (4)
- CPE 405 Software Construction (4)
- CPE 406 Software Deployment (4)
- CPE 453 Operating Systems (4)
- CPE 484 User-Centered Interface Design and Development (4)
- CSC 491, 492 Senior Project (2, 3)
- CSC 494 Cooperative Education Experience or advisor approved technical elective equivalent (6)
- Advisor approved technical electives (12)

One sequence chosen from: (8)

- CPE 365/366 Database Management Systems
- CPE 435/436 Graphical User Interfaces
- CPE 464/465 Computer Networks
- CPE 471/474 Computer Graphics
- CPE 480/481 Artificial Intelligence

Support Courses (total units = 67, of which 36 satisfy GEB requirements)

- BIO 213 and ENGR/BRAE 213 (4)
- ENGL 149 Technical Writing for Engineers (4)
- IME 314 Engineering Economics (3)
- IME 430 Quality Engineering (4) Note: prerequisite will be waived for SE students
- MATH 141, 142, 143, 241 Calculus I, II, III, IV (16)
- MATH 206 Linear Algebra I (4)
- MATH 242 Differential Equations (4)
- One of: MATH 248, 335, 336, 341 (4)
- PSY 201 or PSY 202 General Psychology (4)
- PSY 350 Teamwork (4)
- STAT 321 Prob. and Statistics for Engineers (4)
- Science electives (12)
  - CHEM 124, 125, 129 or PHYS 131, 132, 133
WHEREAS, Title 5 (Division 5, Chapter 1, Subchapter 2, Article 6. Undergraduate Degrees) of the California Code of Regulations requires a minimum of 180 quarter units for graduating with a Baccalaureate degree in the CSU, with the following exceptions:

1. section 40505. (Bachelor of Architecture Degree) "The total number of units required for the Bachelor of Architecture degree shall be distributed over a ten-semester (15 quarter) period or equivalent"

2. section 40507. (Bachelor of Landscape Architecture Degree) "The total number of units required for the Bachelor of Landscape Architecture degree shall be distributed over a ten-semester (15 quarter) period or equivalent" and

WHEREAS, Title 5 (Division 5, Chapter 1, Subchapter 2, Article 6) of the California Code of Regulations also states that:

1. section 40501. (Bachelor of Science Degree) "The number of units for each curriculum shall be determined by each campus"; and

2. section 40508. (The Bachelor's Degree: Total Units) "Each campus shall establish and maintain a monitoring system to ensure that justification is provided for all program requirements that extend the baccalaureate unit requirement beyond 120 [180 quarter] units"; and

WHEREAS, The Chancellor's Office has asked that every campus either reduce each of its programs to 180 quarter units or have that program strongly justify why a higher number of units should be required; and

WHEREAS, Senate Resolution AS-234-87/CC approved by President Baker March 30, 1987 states that "...each major should strive...to include more than the minimum units of unrestricted electives" and documentation should be provided each curriculum cycle from programs requesting exemptions, and Senate Resolution AS-502-98/CC signed by President Baker on September 18, 1998 required that each program submit a self review to the Academic Senate Curriculum Committee justifying the number of units in the degree and examining the possibility of increasing free electives; and
WHEREAS, It is the duty of the faculty of Cal Poly to educate its students so that they graduate as lifelong learners who are prepared to meet both the economic and societal challenges of a world that is becoming increasingly more culturally and technologically diverse; therefore, be it

RESOLVED: That each all programs at Cal Poly offer a curriculum that allows its majors to be educated not only in the discipline but prepares them to be responsible citizens of the world; and be it further

RESOLVED: That all programs strive to reach attempt to meet the Title 5 minimum of 180 quarter units and to provide their students with a well rounded selection of courses which includes:
1. an adequate knowledge of the major as determined by the appropriate faculty, taking into account the recommendations of external, peer reviewers;
2. the General Education requirement;
3. a minimum of 8 units of non-restricted elective courses;
and be it further

RESOLVED: That all academic programs undertake a self-review and, by April 2, 2003, submit to the Academic Senate Curriculum Committee via the respective college curriculum committee an academic plan (of one page or less) to reduce the baccalaureate unit requirement to 180 or provide justification for a baccalaureate unit requirement in excess of 180; and be it further

RESOLVED: That all areas of curriculum--major, support, and General Education--be examined in this review; and be it further

RESOLVED: That subsequent to April 2, 2003, each program's academic plan be incorporated in all academic program reviews, in all proposals for new academic programs, and in all catalog proposal submissions to the Academic Senate Curriculum Committee; and be it further

RESOLVED: That this process serve as Cal Poly's monitoring system to ensure justification for all program requirements that extend the baccalaureate degree beyond the minimum 180 quarter units as required by Title 5.

Proposed by: Curriculum Committee
Date: January 28, 2002
Revised: February 4, 2002
Adopted:

ACADEMIC SENATE
of
CALIFORNIA POLYTECHNIC STATE UNIVERSITY
San Luis Obispo, CA

AS-02/

RESOLUTION ON
PROCESS FOR CHANGE OF MAJOR

WHEREAS, Cal Poly requires students to declare their major upon entrance; and

WHEREAS, Some departments/programs expect students to make progress towards their stated degree while attempting to change into their desired major; and

WHEREAS, Some change of major processes are unwieldy; and

WHEREAS, Some students may not gain acceptance into their desired major within a reasonable time period; therefore, be it

RESOLVED: That the Academic Senate adopt the attached Process for Change of Major document.

Proposed by: Academic Senate
Instruction Committee
Date: December 7, 2001
Revised: February 1, 2002
PROCESS FOR CHANGE OF MAJOR

Applies to matriculated undergraduate students at Cal Poly wishing to change major.

1. An application for internal change of major into less impacted majors will not be considered until/unless a student:
   • has spent completed at least one quarter at Cal Poly
   • has a minimum of a 2.0 grade point average in the "target" (i.e., the major to which the student wishes to change) major's prefix and/or support courses, and
   • is not presently on academic probation.

2. Prior to applying for a change of major, students are strongly advised to consult with the Department chair/head in the target major and one of the following at least two of the following (one should be in the target major):
   ▪ Department chair/head in the target major (i.e., the major to which the student wishes to change)
   ▪ Department chair/head in the current major
   ▪ Faculty in the target major
   ▪ Advising Center staff in the current major
   ▪ Advising Center staff in the target major
   ▪ Career Services staff

3. Departments/programs with heavily impacted majors will:
   ▶ establish and publish each year
     ▪ target numbers for admissions via change of major
     ▪ a competitive process for making change of major decisions, and
     ▪ one or two firm dates for making these decisions
   OR
   ▶ raise the minimum criteria for acceptance to a high enough standard that acceptance is possible at any time for all students who meet the criteria.

The performance criteria established by departments/programs for changing majors will be designed primarily to assess the student's likelihood of achieving success in the new major (taking into account the possibility that poor past performance at Cal Poly may in part reflect an inappropriate choice of major on entry). As far as possible, performance criteria for change of major:
   ▪ will discourage students from seeking "backdoor" entry to a more impacted major by first applying to a less impacted (and more readily accessible) major, while
   ▪ accepting a responsibility to treat existing Cal Poly students who are acting in
good faith somewhat more favorably than those applying from the outside.

It should be possible for most qualified students (i.e., those who are in good academic standing and are academically prepared for the lower division courses that are necessary to assess likelihood of success in the target major) to change their major within three quarters. This process is designed to maximize the probability that students meeting the target department's minimum performance criteria will be accepted within two quarters (at the end of the second quarter, a decision must be made on the acceptance or rejection of each change of major request). Majors may no longer keep waiting lists of students who have met applicable performance criteria but whose entry into the major is being delayed pending space availability. Based on pre-set targets for internal transfers, these majors will hold regular competitions for admission and will give firm acceptance decisions only to those students who can be accommodated promptly; others will be rejected. Denied students may re-apply at a later date but should be made clearly aware that they will not be given preference based on persistence (i.e., repeated applications).

When a freshman student applies to change major within the first three quarters after entering Cal Poly, the target major has the option, where feasible, of using the academic MCA score combined with a specific Cal Poly grade point average for acceptance purposes. Feasibility may depend on whether the MCA scores for the originating and target majors are based on the same formula, and on the availability of relevant historical data. If this option is selected, the target major will:

- Recalculate the academic MCA as if the student had applied to the target major on entry.
- Compare with the academic MCA cut-off used to determine admissions for the fall quarter in which the student first enrolled (when the student first enrolled in winter, the comparison will be made with the admissions cut-off for the preceding fall; when the student first enrolled in summer, the comparison will be made with the admissions cut-off for the following fall).
- Allow the change if the student's MCA exceeds this cut-off, there is space available within the target major, and the student meets the Cal Poly grade point average requirement prescribed by the target major.

A freshman student applying to change major within the first three quarters after entering Cal Poly, whose application is not accepted based on the above MCA scores and Cal Poly cumulative grade point average, or a student applying after the third quarter has passed, or a transfer student from another institution, will be considered on the basis of performance criteria pre-specified by the target major.

The communications sent to students who are not meeting the requirements for making satisfactory progress within their current major should be constructive in tone while clearly indicating:
• the nature of these requirements
• the potential consequences of failing to meet them
• the "window of opportunity" that is available for students seeking to change major.