I. Minutes: Approval of the April 2, 1996 minutes of the Academic Senate (3-4).

II. Communication(s) and Announcement(s):
   A. Nominations are now open for the positions of Academic Senate Chair, Vice Chair, and Secretary. If you are interested in serving in one of these positions, please call the Academic Senate office at 1258/mcaminus@oboe.
   B. Academic Senate election results for 1996-1997 (pp. 5-6).
   C. 1995-96 Faculty PSSIs (pp. 7-18).

III. Reports:
   A. Academic Senate Chair:
   B. President's Office:
   C. Vice President for Academic Affairs:
   D. Statewide Senators:
   E. CFA Campus President:
   F. Staff Council representative:
   G. ASI representatives:
   H. IACC representative:
   I. Other:

IV. Consent Agenda:

V. Business Item(s):
   A. Resolution on Department Name Change for the Agricultural Engineering Department: Bermann, department chair for the Agricultural Engineering Department, second reading (pp. 9-18 in your 4.9.96 agenda).
   B. Resolution on Curricular Structure: Williamson, chair of the Curriculum Committee, second reading (p. 19).
   C. Resolution on Policy and Review Procedures for Discontinuance of an Academic Program: Gowgani, chair of the Long-Range Planning Committee, first reading (pp. 20-26).
   D. Rescission of portion of Resolution on General Committees regarding the nonvoting status of Academic Senate committee chairs: Gooden, statewide senator, first reading (pp. 27-29).
   E. Resolution on External Review: Peck, chair of the Program Review & Improvement Committee, first reading (pp. 30-31).
F. Resolution to Approve Procedures for External Program Review: Peck, chair of the Program Review & Improvement Committee, first reading (pp. 32-36).

G. Resolution on Proposal to Establish an Environmental Biotechnology Institute: Cano, Biological Sciences Department, first reading (pp. 37-48).

H. Resolution to Approve General Education and Breadth Program Proposed Administrative Structure: Hampsey, chair of the GEB Ad Hoc Committee, first reading (cover memo on pp. 49-52, resolution on pp. 53-56).

I. Resolution to Approve Proposed General Education and Breadth Four Unit Template: Hampsey, chair of the GEB Ad Hoc Committee, first reading, (cover memo on pp. 49-52, resolution on pp. 57-58).

J. Resolution on Information Competence: Connely, member of the Computer Literacy Subcommittee, first reading (pp. 59-60).

VI. Discussion Item(s):
   The Cal Poly Plan: ongoing discussion.

VII. Adjournment:
(The individuals whose names are printed in bold type are newly elected senators for the 1996-1997/8 term. The remaining individuals are continuing senators whose terms end in June 1997.)

COLLEGE OF AGRICULTURE (7 senators)

Academic Senate

Amspacher, William
Harris, John
Lund, Michael
O'Keefe, Timothy
Ruehr, Thomas
Warfield, David
Wheatley, JoAnn

Agribusiness
NRM
Animal Science
NRM (one-year term)
Soil Science
Crop Science
Crop Science

COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN (5 senators)

Academic Senate

Berrio, Mark
Clay, Gary
Johnston, Hal
McDonald, Margot
VACANCY

Architectural Engineering
Landscape Architecture
Construction Management
Architecture

COLLEGE OF BUSINESS (5 senators)

Academic Senate

Bertozzi, Dan
Biggs, Joseph
Miller, Tad
Williamson, Dan

Global Strategy/Law
Management
Accounting
Economics

COLLEGE OF ENGINEERING (7 senators)

Academic Senate

Alptekin, Sema
Horton, William
LoCascio, James
Morrobel-Sosa, Anny
Nahvi, Mahmood
Wheatley, Patrick
VACANCY

Ind & Manufacturing Engineering
Electrical Engineering
Mechanical Engineering
Materials Engineering
Electrical Engineering
Computer Science

COLLEGE OF LIBERAL ARTS (9 senators)

Academic Senate

Coleman, James
Hampsey, John
Hiltpold, Paul
Martinez, William
McDermott, Steven
Mott, Stephen
Ryujin, Donald
Spiller, William

Social Sciences
English
History
Foreign Languages & Literatures
Speech Communication
Graphic Communication
Psychology & Human Development
Music

VACANCY

(one-year term)
ACADEMIC SENATE MEMBERSHIP
1996-1997

COLLEGE OF SCIENCE AND MATHEMATICS (8 senators)

Academic Senate
Bowker, Leslie Biological Sciences
DeMers, Gerald Physical Education & Kinesiology
Farrell, Gerald Mathematics
Greenwald, Harvey Mathematics
Hood, Myron Mathematics
Lewis, George Mathematics
Maxwell, John Chemistry
VACANCY (one-year term)

PROFESSIONAL CONSULTATIVE SERVICES (4 senators total, 1 from the Library and 3 from other areas)

Academic Senate
Brown, Johanna Library
Dimmitt, Laura Financial Aid
Domingues, Anthony Admissions
Lutrin, Sam Student Life & Activities

UNIVERSITY CENTER FOR TEACHER EDUCATION (1 senator)

Academic Senate
VACANCY

STATEWIDE ACADEMIC SENATE (3 statewide senators)

Gooden, Reg Political Science
Hale, Thomas Mathematics
Kersten, Timothy Economics
State of California  
Memorandum  

APR 23 1996
Academic Senate

To: Harvey Greenwald  
Chair, Academic Senate

From: Warren J. Baker  
President

Date: April 18, 1996
Copies: P. Zingg  
Deans  
M. Suess  
G. Lewis

Subject: 1995-96 Faculty PSSIs

Enclosed is a summary of the 1995-96 Faculty Performance Salary Step Increases. I have previously shared with you the information I sent to the Deans and Instructional Department Heads/Chairs that explained the basis for the final decisions (copy enclosed).

Please share the attached summary with members of the Academic Senate.

Enclosures
### 1995-96 Faculty Performance Salary Step Increases (PSSI)

<table>
<thead>
<tr>
<th>College</th>
<th>Candidates</th>
<th>Recipients</th>
<th>1 Steps</th>
<th>2 Steps</th>
<th>3 Steps</th>
<th>Jan-Jun 1996 Cost</th>
<th>Jan-Jun 1996 (%)</th>
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<tr>
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<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Agriculture</td>
<td>13 (8.9%)</td>
<td>7 (12.73%)</td>
<td>6</td>
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<td>0</td>
<td>$6,456 (11.11%)</td>
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<tr>
<td>Arch &amp; Envr Design</td>
<td>9 (5.81%)</td>
<td>2 (3.64%)</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1,488 (2.56%)</td>
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<tr>
<td>Business</td>
<td>18 (11.61%)</td>
<td>3 (5.45%)</td>
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<td>3</td>
<td>0</td>
<td>5,076 (8.73%)</td>
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<tr>
<td>Engineering</td>
<td>25 (16.13%)</td>
<td>6 (10.91%)</td>
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<td>6</td>
<td>0</td>
<td>9,462 (16.28%)</td>
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<tr>
<td>Liberal Arts</td>
<td>56 (36.13%)</td>
<td>19 (34.55%)</td>
<td>14</td>
<td>4</td>
<td>1</td>
<td>17,742 (30.52%)</td>
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<tr>
<td>Science and Mathematics</td>
<td>29 (18.71%)</td>
<td>14 (25.45%)</td>
<td>10</td>
<td>3</td>
<td>1</td>
<td>14,106 (24.52%)</td>
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<tr>
<td>UCTE/Library/Counselors</td>
<td>5 (3.23%)</td>
<td>4 (7.27%)</td>
<td>3</td>
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<td>0</td>
<td>3,798 (6.53%)</td>
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<tr>
<td><strong>Total</strong></td>
<td>155 (100%)</td>
<td>55* (100%)</td>
<td>35</td>
<td>18</td>
<td>2</td>
<td>$58,128 (100%)</td>
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*55 Recipients: Professors (48); Associate Professors (5); Librarian (1); Lecturer (1)*

**Balance:** $56
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<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Rank</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Charles M. Burt</td>
<td>Agricultural Engineering</td>
<td>Professor</td>
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<tr>
<td>Leslie S. Ferreira</td>
<td>Dairy Science</td>
<td>Professor</td>
<td></td>
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<tr>
<td>Mary Pederson</td>
<td>Food Science and Nutrition</td>
<td>Professor (12-mo)</td>
<td></td>
</tr>
<tr>
<td>Douglas D. Piirto</td>
<td>Natural Resources Management</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>Joseph E. Sabol</td>
<td>Agricultural Education</td>
<td>Professor (12-mo)</td>
<td></td>
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<tr>
<td>Mark Shelton</td>
<td>Crop Science</td>
<td>Professor (12-mo)</td>
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<td>James Vilkitis</td>
<td>Natural Resources Management</td>
<td>Professor</td>
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<p>| MONTHLY TOTALS     |                                   | 1,076                 |
| 6-MONTH TOTALS     |                                   | 6,456                 |</p>
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<th>Name</th>
<th>Department</th>
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<tbody>
<tr>
<td>Donna P. Duerk</td>
<td>Architecture</td>
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<tr>
<td>Donald S. Woolard</td>
<td>Architecture</td>
<td>Professor</td>
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<tr>
<td><strong>MONTHLY COST</strong></td>
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<td><strong>6-MONTH COSTS</strong></td>
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<td>1,488</td>
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<tr>
<td>Name</td>
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<tr>
<td>------------------------</td>
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<td>-----------------</td>
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</tr>
<tr>
<td>Lee B. Burgunder</td>
<td>Global Strategy and Law</td>
<td>Professor</td>
<td></td>
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<tr>
<td>Jack Robison</td>
<td>Accounting</td>
<td>Professor</td>
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<tr>
<td>A. B. (Rami) Shani</td>
<td>Management</td>
<td>Professor</td>
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**MONTHLY COST**

| Cost | 846 |

**6-MONTH COSTS**

<p>| Cost | 5,076 |</p>
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<th>Department</th>
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<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>William C. Buckalew</td>
<td>Computer Science</td>
<td>Associate Professor</td>
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</tr>
<tr>
<td>Michael M. Cirovic</td>
<td>Electrical Engineering</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>Russell Cummings</td>
<td>Aeronautical Engineering</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>Jay S. DeNatale</td>
<td>Civil and Environmental Engineering</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>Edward Sullivan</td>
<td>Civil and Environmental Engineering</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>Linda Vanasupa</td>
<td>Materials Engineering</td>
<td>Associate Professor</td>
<td></td>
</tr>
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</table>

MONTHLY COST

| 6-MONTH COSTS        | 9,462                          |

PSSI-RPT.XLS
<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Rank</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stephen Ball</td>
<td>Philosophy</td>
<td>Professor</td>
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</tr>
<tr>
<td>Nancy Clark</td>
<td>History</td>
<td>Associate Professor</td>
<td></td>
</tr>
<tr>
<td>George Cotkin</td>
<td>History</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>John Culver</td>
<td>Political Science</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>Susan Duffy</td>
<td>Speech Communication</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>John C. Hampsey</td>
<td>English</td>
<td>Associate Professor</td>
<td></td>
</tr>
<tr>
<td>David Henry</td>
<td>Speech Communication</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>Paula Huston</td>
<td>English</td>
<td>Lecturer B</td>
<td></td>
</tr>
<tr>
<td>William T. Little</td>
<td>Foreign Languages and Literatures</td>
<td>Professor</td>
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<tr>
<td>William L. Preston</td>
<td>Social Sciences</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>Robert Reynolds</td>
<td>Art and Design</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>Philip K. Ruggles</td>
<td>Graphic Communication</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>Craig Russell</td>
<td>Music</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>Donald H. Ryuji</td>
<td>Psychology and Human Development</td>
<td>Associate Professor</td>
<td></td>
</tr>
<tr>
<td>Tal Scriven</td>
<td>Philosophy</td>
<td>Professor</td>
<td></td>
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<tr>
<td>Charles M. Slem</td>
<td>Psychology and Human Development</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>Joseph N. Weatherb</td>
<td>Political Science</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>Michael J. Wenzl</td>
<td>English</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>Calvin H. Wilvert</td>
<td>Social Sciences</td>
<td>Professor</td>
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MONTHLY COST: 2,957

6-MONTH COSTS: 17,742
<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Rank</th>
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</thead>
<tbody>
<tr>
<td>Christina A. Bailey</td>
<td>Chemistry and Biochemistry</td>
<td>Professor</td>
</tr>
<tr>
<td>Ronald Brown</td>
<td>Physics</td>
<td>Professor</td>
</tr>
<tr>
<td>Raul J. Cano</td>
<td>Biological Sciences</td>
<td>Professor</td>
</tr>
<tr>
<td>Gerald DeMers</td>
<td>Physical Education and Kinesiology</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Jay Devore</td>
<td>Statistics</td>
<td>Professor</td>
</tr>
<tr>
<td>Richard B. Frankel</td>
<td>Physics</td>
<td>Professor</td>
</tr>
<tr>
<td>Harvey Greenwald</td>
<td>Mathematics</td>
<td>Professor</td>
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<tr>
<td>Kellie G. Hall</td>
<td>Physical Education and Kinesiology</td>
<td>Associate Professor</td>
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<tr>
<td>Kenneth A. Hoffman</td>
<td>Physics</td>
<td>Professor</td>
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<tr>
<td>V. L. Holland</td>
<td>Biological Sciences</td>
<td>Professor (12-mo)</td>
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<tr>
<td>David J. Keil</td>
<td>Biological Sciences</td>
<td>Professor</td>
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<tr>
<td>John F. Marlier</td>
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<tr>
<td>Raymond M. Nakamura</td>
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<tr>
<td>James L. Webb</td>
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MONTHLY COSTS  

<table>
<thead>
<tr>
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<td>2,351</td>
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6-MONTH COSTS

<table>
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<td>14,106</td>
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<tr>
<td>Name</td>
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<tr>
<td>Leonard Davidman</td>
</tr>
<tr>
<td>Nancy Loe</td>
</tr>
<tr>
<td>Donald K. Maas</td>
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<tr>
<td>Susan McBride</td>
</tr>
</tbody>
</table>

MONTHLY COST

6-MONTH COSTS 3,798
Memorandum

To: Deans and Department Heads/Chair

Date: April 5, 1996

File No.: 

Copies: Paul Zingg
Bill Kellogg
Harvey Greenwald
George Lewis
Mike Suess

From: Warren J. Baker
President

Subject: Performance Salary Step Increases (PSSI)

Performance Salary Step Increases (PSSI's) were awarded to 55 faculty unit employees under the new collective bargaining agreement. The relatively small allocation of $58,184 limited the number of awards this year. The salary increases will be retroactive to January 1, 1996.

PSSI's were recommended by faculty committees at the college and university levels based on procedures and criteria developed by the Academic Senate. Of the 155 applicants/nominations, 18 faculty members were "highly recommended" by the University Committee, 70 received a favorable "recommendation," and 67 were not recommended.

With one exception PSSI awards were made on the following basis:

1) those "highly recommended by both the University Committee and the College Committee (17 awards);

2) those "highly recommended" by either the University Committee or the College Committee and "recommended" by the other committee (31 awards); and

3) those "recommended" by both the University Committee and the College Committee who were also recipients of a distinguished teaching award (6 awards).

The following faculty are recognized for their contributions to the University through their record of outstanding teaching and meritorious professional accomplishments and/or service:
Christina Bailey (Chemistry and Biochemistry)
Stephen Ball (Philosophy)
Ronald Brown (Physics)
W. Chris Buckalew (Computer Science)
Lee Burgunder (Global Strategy and Law)
Charles Burt (Agricultural Engineering)
Raul Cano (Biological Sciences)
Michael Cirovic (Electrical Engineering)
Nancy Clark (History)
George Cotkin (History)
John Culver (Political Science)
Russell Cummings (Aeronautical Engineering)
Leonard Davidman (University Center for Teacher Education)
Gerald DeMers (Physical Education and Kinesiology)
Jay DeNatale (Civil and Environmental Engineering)
Jay Devore (Statistics)
Donna Duerk (Architecture)
Susan Duffy (Speech Communication)
Leslie Ferreira (Dairy Science)
Richard Frankel (Physics)
Harvey Greenwald (Mathematics)
Kellie Hall (Physical Education and Kinesiology)
John Hampsey (English)
David Henry (Speech Communication)
Kenneth Hoffman (Physics)
Paula Huston (English)
David Keil (Biological Sciences)
V. L. Holland (Biological Sciences)
William Little (Foreign Languages and Literatures)
Nancy Loe (Library)
Donald Maas (University Center for Teacher Education)
John Marlier (Chemistry and Biochemistry)
Susan McBride (University Center for Teacher Education)
Raymond Nakamura (Physical Education and Kinesiology)
Mary Pedersen (Food Science and Nutrition)
Douglas Piirto (Natural Resources Management)
William Preston (Social Sciences)
Robert Reynolds (Art and Design)
Jack Robison (Accounting)
Philip Ruggles (Graphic Communication)
Craig Russell (Music)
Donald Ryujin (Psychology and Human Development)
Joseph Sabol (Agricultural Education)
Tal Scriven (Philosophy)
Rami Shani (Management)
Mark Shelton (Crop Science)
Charles Slem (Psychology and Human Development)
Edward Sullivan (Civil and Environmental Engineering)
Linda Vanasupa (Materials Engineering)
James Vilkitis (Natural Resources Management)
Joseph Weatherby (Political Science)
James Webb (Physical Education and Kinesiology)
Michael Wenzl (English)
Calvin Wilvert (Social Sciences)
Donald Woolard (Architecture)

Please share this information with faculty in your area.
<table>
<thead>
<tr>
<th>University</th>
<th>Total Applicants</th>
<th>Steps Awarded</th>
<th>Four Steps</th>
<th>Three Steps</th>
<th>Two Steps</th>
<th>One Step</th>
<th>PSSI's</th>
<th>*Rec.</th>
<th>**Not Rec.</th>
<th>% of Faculty Awarded</th>
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</thead>
<tbody>
<tr>
<td>San Jose</td>
<td>392</td>
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<td>11</td>
<td>93</td>
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<tr>
<td>San Diego</td>
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*Faculty awarded PSSI's who were recommended by committee
**Faculty awarded PSSI's who were not recommended by committee
***Distribution not yet determined

Information compiled by:

Donald J. Cameron
Associate Vice President, Faculty Affairs
California State University, Northridge

Based on report from Associate Vice Presidents, Faculty Affairs/Deans of Faculty on CSU campuses.

4/10/96
Academic Senate
Of
California Polytechnic State University
San Luis Obispo, California

AS-96/
Resolution on Curricular Structure

Whereas, a "major" is defined as a program of study that provides students with the knowledge, skills, and experiences necessary to pursue a specific career or advanced study and leads to a degree in that subject; and

Whereas, Title 5 specifies the maximum units in a degree and the minimum units in a major, but does not specify a maximum number of units for the major; and

Whereas, major courses are:
- required courses having the prefix of the major program or college;
- required prerequisite courses;
- courses from any other prefix or discipline which are required in the major field of study;
- required courses that count toward the major GPA; and

Whereas, in the past, the limit on units in the major caused some programs to require additional units in the "support" component, but recent changes in University policy have alleviated this circumstance; and

Whereas, Changes in campus policy regarding the counting of units in the major and support components of the curriculum have faded the distinction between the two; and

Whereas, The major department determines which courses are required in the major and support components; and

Whereas, support courses are often viewed as prerequisites to major courses; and

Whereas, Campus policy requires a 2.0 GPA in major courses, a requirement that does not account for major and/or concentration courses in the support component; and

Whereas, Because they are exempt from the 2.0 GPA requirement, support courses are often interpreted as being less important than major courses; therefore, be it

Resolved: That the major and support courses be merged into a single component of the curriculum titled "major."

Proposed by the Curriculum Committee
February 16, 1996
RESOLVED: That the Academic Senate of Cal Poly approve the attached Policy and Review Procedures for Discontinuance of an Academic Program; and, be it further

RESOLVED: That the attached Policy and Review Procedures for Discontinuance of an Academic Program be forwarded to the President and Vice President for Academic Affairs for approval and implementation.

Proposed by the Academic Senate Long-Range Planning Committee
February 15, 1996
POLICY AND REVIEW PROCEDURES
FOR DISCONTINUANCE OF AN ACADEMIC PROGRAM

Many CSU campuses, including Cal Poly, San Luis Obispo, may find it necessary to reduce faculty, support, and administrative positions due to enrollment declines or financial support reductions. When financial support is reduced, the discontinuance of programs or departments sometimes emerges as the alternative which does the least harm to the quality of remaining programs. Program and department discontinuance are valid ways of responding to reductions in resources; however, program discontinuance can and must be accomplished with minimal impact. Program discontinuance decisions must be made in a reasoned way which will minimize damage to institutions and to the majority of their programs.

The following procedures have been developed in response to Ep&R 79-10, January 26, 1979, Chancellor Dumke to Presidents, "Interim Policy for the Discontinuance of Academic Programs," and EP&R 80-45, June 12, 1980, Vice Chancellor Sheriffs to Presidents, "Clarification of Interim Policy for Discontinuance of Academic Programs." These documents outline general procedures for program discontinuance and request that campuses submit local discontinuance procedures.

I. PROCEDURES
A. Initiation of a discontinuance proposal.
A proposal to discontinue an academic program will ordinarily be the result of regular program review but a request for special review may be initiated at any time by any of the following:

- A majority of the tenured and tenure track faculty of the affected department(s)
- The dean of any of the schools involved in the program.
- The Vice President for Academic Affairs.
- The President of the University.

The proposal shall clearly indicate that the proposed discontinuance is to be permanent. The proposal shall be submitted to the Vice President for Academic Affairs for review.

B. Review of a discontinuance proposal.
The Vice President for Academic Affairs will review the proposal for discontinuance and accept or reject the proposal within three calendar weeks. If the request for review is approved, a Discontinuance Review Committee will be appointed within three calendar weeks after approval, to conduct a review in accordance with the procedures outlined in this document and make recommendations to the Vice President for Academic Affairs, as required by the CSU Chancellor's Office.

C. Appointment of a Discontinuance Review Committee.
The discontinuance review committee will consist of two groups.
The first group will include six persons (one non voting):
1. A representative from the Academic Program office (nonvoting) nominated by the Vice President of Academic Affairs
2. Two members of the Deans Council representing colleges not involved in the program and nominated by the chair of the Academic Senate.
3. One student not involved in the program, nominated by the ASI President
4. Two faculty representatives from colleges not involved in the program, nominated by the Chair of the Academic Senate

The second group will include five persons:
1. The Dean of the college(s) involved in the program (or a representative nominated by the Dean).
2. The heads of departments or the coordinators of areas involved in the program
3. One student involved in the program, nominated by the ASI President
4. Faculty representatives involved in the program, nominated by the tenured and tenure track faculty involved in the program. The number of faculty representatives shall be such that the group is made of five persons. There will be at least one faculty from each program involved if there is more than one program being reviewed.

D. Recommendations from the committee.
The ultimate decision to discontinue a program rests with the Chancellor’s office. The purpose of the Discontinuance Review Committee is to create a report for the President or Vice President for Academic Affairs on the merits or lack of merit of the program under review. If there is no opposition to the proposed discontinuance within the committee, the proposal will be forwarded to the Vice President for Academic Affairs, with a report indicating that there is no opposition. If any of the committee members oppose the discontinuance, the Discontinuance Review Committee will generate a report, using the following two step process.

In the first step, each group will elect its own chair and create a document describing the strengths and weaknesses of the program under review, and a justification of why the program should or should not be terminated. The documents must be generated within sixteen weeks after the committee has been appointed. The merits of the program shall be assessed using the elements described in sections II and III below, and in the Academic Program Review and Improvement Guidelines. If appropriate, the document shall include what remedies could be taken to address weaknesses, including a precise statement of goals and a time table to reach those goals.

The chair of each group shall make the document available to all faculty members for comments for four weeks. A written request for comments must be sent to all the faculty and staff directly affected by the potential discontinuance at the start of the period for comments.

In the second step, immediately following the four weeks of comments, the two groups will exchange documents and provide a critique of the arguments presented in the document from the other group within six weeks.

The two groups will then merge into a single group of eleven members (one non voting), and within four weeks elect a chair and jointly discuss and amend the documents produced. The final version of the two analyses, with the comments from the other groups, and with all the information deemed relevant, shall be bound in a single document (which, at this point, should have a format similar to what is produced by the state analyst to assist voters). A tally of how many committee members are in favor or against discontinuance shall be part of the final document sent to the Vice President for Academic Affairs, the Academic Deans Council and the Academic Senate for their review and recommendation.
E. Final decision on discontinuance of the program.
The Vice President for Academic Affairs, the Academic Deans Council and the Academic Senate will forward their recommendations to the President within six weeks, and the president will make his final recommendation to the Chancellor's Office.

II. CONSIDERATIONS IN PROGRAM DISCONTINUANCE REVIEW
Considerations for program discontinuance will be similar to those for initiation of new programs. In addition to the program review criteria, the elements that must be considered in a final recommendation must also include, but will not be limited to:

1. The University Strategic Plan and Mission statement.
2. The impact of discontinuance on student demand.
3. The impact of discontinuance on Statewide or regional human resources needs.
4. The effectiveness of the program to meet the identified needs.
5. The existence of programs within the CSU which could enroll students in this program.
6. A three year history of the total cost per FTEF and per FTES for the program at Cal Poly and at other institutions offering comparable programs.
7. The effects of discontinuance on facilities:
8. The financial effects of discontinuance, including an estimate of the yearly costs or savings for the three years following discontinuance.
9. The effects on faculty and staff, including a description of what career opportunities the CSU will offer them: agreements to transfer to other departments or to other branches of the CSU, retraining, etc.

III. INFORMATION FOR PROGRAM DISCONTINUANCE REVIEW
The information considered during the evaluation of an academic program for discontinuance will contain all the information that is needed for the creation of a new program. In addition, the information will include but will not be limited to:

A. The most recently completed Review of Existing Degree Programs with current statistical update.
B. The most recent accreditation report, if a program is accredited or approved. If the accreditation is over six years old, or if there is no accrediting body for the program, a review of the program by a panel of professionals outside the CSU can be substituted for the accreditation report, provided the review has been done within the last six years. The review shall contain all the elements included in an accreditation report.
C. If not contained in A or B:
   1. FTEF required each quarter for the past three years
   2. Special resources and facilities required
   3. Number of students expected to graduate in each of the next three years.
D. Conclusions and recommendations of the project team on Academic Programs, contained in the most recent edition of Academic Program and Resource Planning In the California State University and Colleges, p-28.
TIME TABLE FOR PROGRAM DISCONTINUANCE

Initial step

1 Proposal to discontinue an academic program received by the Vice President for Academic Affairs.

Three calendar weeks after receipt of the proposal

2 The Academic Vice President accepts or rejects the proposal.

Three calendar weeks after acceptance of the proposal

3 Discontinuance Review Committee appointed

Within sixteen weeks after appointment of the Discontinuance Review Committee

4 Initial report: Each of the two groups from the program discontinuance committee produce their report and exchange it for the report from the other group.

Within four weeks after the initial reports have been exchanged

5 Period of comments: Each of the two groups from the program discontinuance committee solicit comments on the reports from the University at large.

Within six weeks after the end of the period of comments

6 Critique of the initial reports: Each of the two groups from the program discontinuance committee produce a critique of the arguments produced by the other group.

Within four weeks after the critique of reports have been produced

7 Final report: The two groups from the program discontinuance committee jointly discuss and amend, if necessary, the final document, and send it to the Vice President for Academic Affairs, the Academic Deans Council and the Academic Senate.

Within four weeks after the critique of reports have been sent

8 Recommendations: The Vice President for Academic Affairs, the Academic Deans Council and the Academic Senate make a recommendation to the President.

NOTE: A calendar week is five working days. Calendar weeks exclude Summer break and the breaks between quarters.
<table>
<thead>
<tr>
<th>Event</th>
<th>Time (in weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiation of the proposal</td>
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<tr>
<td>Review by the Academic VP</td>
<td>3</td>
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<tr>
<td>Appointment of the committee</td>
<td>3</td>
</tr>
<tr>
<td>First step of the review</td>
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<td>Period of comments</td>
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<td>Final document drafted</td>
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<td>Review by upper levels</td>
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<tr>
<td>Final comments to the President</td>
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<tr>
<td>Total time</td>
<td>42 weeks</td>
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Adopted:

ACADEMIC SENATE
OF
CALIFORNIA POLYTECHNIC STATE UNIVERSITY
San Luis Obispo, California

AS-95/
RESOLUTION ON
GENERAL COMMITTEES

Background Statement: During the summer of 1995, an Academic Senate ad hoc committee, consisting of Margaret Camuso, Nancy Clark, Charles Dana, Harvey Greenwald, John Hampsey, Tim Kersten, and Susan Opava, was formed to evaluate the organization and structure of the present Academic Senate committees and to make recommendations, if necessary, for improved committee functioning.

In order to evaluate the efficiency of the Senate’s present committee structure, it identified what the Senate’s key functions and roles were, then looked at whether the existing committee structure: (1) effectively carried out these key functions and roles; (2) utilized faculty time productively; (3) encouraged faculty participation; (4) duplicated committee responsibilities; (5) was outdated in any way; and (6) whether the present committee structure was fluid enough to accommodate current and potential changes occurring within higher education.

After careful evaluation, the following recommendations have been prepared by the Ad Hoc Committee to Review the Organization and Structure of Academic Senate committees.

WHEREAS, the effective functioning of Academic Senate committees depends strongly on its committee chairs; and

WHEREAS, the effective functioning of Academic Senate committees depends strongly on communication; therefore, be it

RESOLVED: That the attached revisions to the Bylaws of the Academic Senate be approved:

Proposed by the Academic Senate
Executive Committee
January 30, 1996
RESOLUTION ON ACADEMIC SENATE
GENERAL COMMITTEES
AS-___-96/EC

For ease of deliberation, the following text has been excerpted from the Constitution of the Faculty and Bylaws of the Academic Senate, and suggested changes have been made in strikeout and underline format.

(Excerpted from Bylaws of the Academic Senate, Section VII. Committees)

VII. COMMITTEES
A. GENERAL
   The functional integrity of the Senate shall be maintained by the committee process. The committee structure shall include standing committees staffed by appointment or ex officio status, elected committees staffed by election, and ad hoc committees which might be staffed either by appointment or election, as directed by the Senate.

B. MEMBERSHIP
   Except as noted in the individual committee description, committees shall include at least one representative from each college and from Professional Consultative Services. Additional ex officio representation may include ASI members appointed by the ASI president, the Chair of the Senate, faculty emeriti, and other representation when deemed necessary by the Senate. Ex officio members shall be voting members unless otherwise specified in the individual committee description.

   During the second week of Spring Quarter, the new each caucus shall convene to nominate candidates from that college or Professional Consultative Services to fill committee vacancies occurring for the next academic year. The caucus shall obtain a statement of willingness to serve from each nominee.

   These nominations shall be taken to a meeting of the newly-elected Executive Committee before the June regular meeting of the Senate. The Executive Committee shall appoint members to standing committee vacancies from these lists of nominations, unless another method of selection is specified in these Bylaws. Each appointed member shall serve for two years. No person shall be assigned concurrent membership on more than one standing committee, except Executive Committee members, who may serve on that committee and one other.

C. COMMITTEE CHAIRS
   The Academic Senate Executive Committee shall appoint the chairs of the General Standing Committees. The chairs of these committees shall be nonvoting and may be chosen from within or outside the committee. If the
chair is chosen from within the committee, a new appointment to the committee shall be made by the Executive Committee from the chair’s college to ensure that the college has voting representation. Committee chair appointments will be submitted to each committee for its approval. The chairs of the Special Standing Committees shall be elected annually by a majority vote of the eligible voters on the committee.

The chair need not be an academic senator. The chair shall be responsible for reporting committee activities to the Academic Senate. The chair shall notify the chair of the college caucus whenever a member has not attended two consecutive meetings. Committee chairs shall meet with the Chair of the Academic Senate at least once per quarter.

D. OPERATING PROCEDURES
Operating procedures of each committee shall be on file in the office of the Senate.

E. MEETINGS
Meetings of all committees, except those dealing with personnel matters of individuals, shall be open. The time and place of each meeting shall be announced in advance.

F. REPORTING
Each committee shall maintain a written record of its deliberations. Minutes of each meeting shall be submitted to the Academic Senate office. A summary report shall be submitted to the Academic Senate Executive Committee at the end of each quarter. Year-end report shall be submitted to the outgoing Executive Committee before the June regular meeting of the Senate.

G. MINORITY REPORTS
Minority reports may be submitted with the reports of the committees.
Adopted:

ACADEMIC SENATE
OF
CALIFORNIA POLYTECHNIC STATE UNIVERSITY
San Luis Obispo, California

Background

The purpose of external review is to provide the opportunity for objective outside input on academic degree programs. For some degree programs, accreditation review serves this purpose. For degree programs which are not subject to accreditation review, formal external review provides a mechanism for outside input.

In departments that offer more than one degree, external review of the degree programs may be combined into a single review. Where accreditation review occurs at the College level, this review can be considered as an external review as long as the accreditation report makes substantive comments about individual programs within the College. Interdisciplinary degree programs may be evaluated by a single external review, as long as the review team is appropriately constituted.

RESOLUTION ON EXTERNAL REVIEW

AS-96/

WHEREAS, The Commitment to Visionary Pragmatism document has identified external program review as necessary; and

WHEREAS, specialized accreditation is not available for some degree programs or available accreditation may be deemed unnecessary by the department and the Vice President for Academic Affairs, be it therefore

RESOLVED, that all degree programs, in consultation with their college dean, will seek either specialized accreditation or undergo external review; and be it further

RESOLVED, that the timing of external review efforts be coordinated with the Academic Senate Program Review & Improvement Committee to minimize the workload of the program faculty in preparing for review; and be it further
RESOLVED, that the results of specialized accreditation review or external review will be communicated to the college dean, the Academic Senate Program Review & Improvement Committee, and to the President or his/her designee; and be it further

RESOLVED, that program faculty will have an opportunity to respond in writing to all findings and recommendations raised during the review process; and be it further

RESOLVED, that the President or his/her designee will report to the program, the college dean, and to the Academic Senate Program Review & Improvement Committee within six months regarding recommendations made to the program during the review process.

Proposed by the Academic Senate Instruction Committee and the Academic Senate Program Review & Improvement Committee

xxxxx, 1996
RESOLVED, That the attached procedures for external program review be approved, and be it further

RESOLVED, the attached procedures for external program review be forwarded to the President for approval and implementation.
PROCEDURES FOR EXTERNAL PROGRAM REVIEW

The purpose of external program review is to provide the opportunity for outside input on academic programs, resulting in suggestions for program improvement. It is recommended that external review occur every five years, preferably taking place the year before the program is scheduled for review by the Academic Senate Program Review and Improvement Committee.

The Review Panel

The review panel will be composed of three persons not affiliated with Cal Poly. The panel will include at least one academic representative of the discipline from another institution, and may include a representative from industry or a public agency where appropriate. The panel may also include an academic member from a closely related discipline or an academic administrator.

The Vice President of Academic Affairs will prepare a list of at least six potential reviewers. The list of potential reviewers will be developed in consultation with the department and its respective dean. The department will then select review team members from this list.

One of the academic members of the review team will be selected to chair the committee. The chair will be responsible for submitting a final report.

Preparation for Review

In preparation for external review, the following items are to be submitted to the reviewers at least one month prior to their campus visit:

1. Faculty vitae
2. Statement of department mission, goals, and objectives.
3. Curricular requirements, including a comparison to similar programs in California and the nation.
4. An expanded course outline, statement of learning objectives, and syllabus for each course offered by the department. Samples of course materials, student work, exams and other assessments, grading policy, and grade distributions need not be sent prior to the visit unless requested by the review team, but should be available for review during the campus visit.
5. Description of relevant facilities, including library and computer facilities.
6. Program data, including:
   1. Faculty demographics and faculty recruiting plan
   2. Student demographics and student recruitment efforts
   3. Demand for the program, including number of applications received and percent admitted.
   4. Average GPA and SAT scores for entering students and MCA criteria
   5. Retention and graduation rates
   6. Assessment of job market for graduating students
   7. Awards and honors received by students
   8. Involvement with the professional community and industry

Campus Visit

The department will develop a schedule for the campus visit. The campus visit should include meetings with department faculty individually or in small groups, meetings with appropriate administrators including the Department Chair/Head, Dean, and Vice President for Academic Affairs, and a meeting with representative students. The campus visit should conclude with an exit interview with the Department Chair/Head, the Dean, and the Vice President for Academic Affairs.

Reviewer Guidelines

Reviewers should consider the following issues in conducting their review, and should address these issues in their report:

1. Department Objectives
   a. What are the program goals of the department for the next five years?
   b. Are department goals and objectives judged to be appropriate given general trends in the discipline?
   c. How does the department plan to meet its five-year goals?

2. Academic Program
   a. Program
      i. How does the academic program compare to that of comparable institutions?
      ii. What are the distinguishing features of the academic program?
      iii. What significant changes have been made in the academic program in the last five years?
b. Curricular Content
   i. Are there emerging trends or areas within the discipline which should be included or expanded in the curriculum?
   ii. Are there out-of-date elements which should be phased out or deleted?

c. Instructional Methods
   i. Are instructional methods employed and use of technology appropriate given the learning objectives of the program?

d. Learning Objectives
   i. Are course learning objectives appropriate and linked to observable behaviors that demonstrate or imply competence?
   ii. What evidence is there about the degree to which students attain these objectives?

e. Strengths and Weaknesses
   i. In what ways could the program be strengthened and improved?

3. Faculty
   a. Are the faculty active in curricular development, instructional design, and university service.
   b. Is there an appropriate level of professional development across the department faculty?
   c. What research projects are each of the department faculty pursuing?
   d. What consulting and special projects are each of the faculty pursuing, and how are they linked to the academic program?
   e. Is there an appropriate faculty recruitment plan that addresses gender and ethnic diversity goals?

4. Summary
   a. Is the department meeting its program, instructional, and learning objectives?
   b. What are the strengths and achievements of the program?
   c. What suggestions for improvement can be made?
   d. What are the most important challenges facing the department?
Written Report

The chair of the review team is responsible for the written report organized around the above guidelines. A draft report should be submitted to the Department for an accuracy check of factual information at least 10 days prior to submission of the final report. The final written report should be submitted no later than 45 days after the review. The report will be submitted to the Vice President for Academic Affairs, with copies to the Dean and Department Chair.

Expenses

The Vice President for Academic Affairs will cover the expenses of external review.

Post Review Recommendations

The President or his/her designee will respond to the department, the college dean, and the Academic Senate Program Review and Improvement Committee within six months regarding the recommendations of the external review team. The department, in consultation with the Dean, will respond to any concerns, problems, or issues identified in the external review and in the President's response by developing an action plan that addresses these issues. The department's response and action plan shall be presented to the Program Review and Improvement Committee, which will work in consultation and collaboration with the department to implement the plan and monitor its progress.
RESOLVED: That an Environmental Biotechnology Institute be established at Cal Poly as proposed in the attached bylaws of the Proposal: Environmental Biotechnology Institute.

Proposed by the College of Science and Mathematics
April 16, 1996
PROPOSAL
ENVIRONMENTAL BIOTECHNOLOGY INSTITUTE

California Polytechnic State University

Aristotle said it more than two millennia ago: "What we have to learn to do, we learn by doing." California Polytechnic State University (Cal Poly) is an institution known for its undergraduate education in the applied sciences. The educational philosophy of "learn by doing" has been the underlying reason for this institution's success in training and educating undergraduate students. Largely because of our commitment to undergraduate education and academic excellence, Cal Poly has been cited as one of America's best universities in undergraduate science education by U.S. News and World Report. It is in the spirit of the Cal Poly's philosophy of providing "hands on" experience to students and faculty alike that the Environmental Biotechnology Institute is based.

Biotechnology can be used to assess the well-being of ecosystems, transform pollutants into benign substances, generate biodegradable materials from renewable sources, and develop environmentally safe manufacturing and disposal processes. Researchers are just beginning to explore biotechnological approaches to problem-solving in many areas of environmental biotechnology, such as:

- Diagnostics, epidemiology, and dispersal-monitoring related to human disease agents;
- Disease, pest, and weed control in agriculture;
- Contaminant detection, monitoring, and remediation;
- Toxicity screening; and
- Conversion of waste to energy.

Environmental biotechnology is not a new field; composting and wastewater treatment technologies are familiar examples of "old" environmental biotechnologies. However, recent developments in molecular biology, microbial ecology, and environmental engineering now offer opportunities to modify organisms so that their basic biological processes are more efficient and can degrade more complex chemicals and higher volumes of waste materials. Notable accomplishments of the "new" environmental biotechnology include the cleanup of water and land areas polluted with petroleum products.

While some success has been achieved, the potential benefits of the new environmental biotechnology are far from fully realized. Advances in this area are delayed not only by legal and social barriers but also by the scarcity of basic scientific knowledge about organisms that may be used in biotechnologies and the ecological systems in which these technologies are to be employed. Only new knowledge acquired through basic research can provide the foundation for new environmental applications of biotechnology, facilitate the development of these technologies by the commercial sector, and ensure adequate evaluation and safe application of products without blocking innovation with regulatory requirements.

Research in environmental biotechnology has unique international aspects. International cooperation will be needed to help generate new scientific knowledge in this arena, assure U.S. access to the requisite technologies and genetic resources, and establish markets for the resulting U.S. products and processes worldwide. In addition, environmental biotechnology has tremendous potential for use in developing nations seeking low-cost solutions to environmental problems, such as municipal waste disposal, conversion of agricultural wastes to energy sources, and cleanup of polluted areas.

Here, a research-based Institute is proposed for the purpose of exploring biotechnological approaches to problem-solving in the area of environmental biotechnology. Through the use of microorganisms and their products, the Institute would involve students and Faculty from Cal Poly and other CSU campuses as well as the international scientific community. The proposed Institute has collaborative research agreements in the area of Environmental Biotechnology with the Dairy Products Technology Center at Cal Poly, the Environmental Biology Department at the University of the Balearic Islands, Palma de Mallorca, Spain, and the Chemistry Department, University of Portugal, Lisboa, Portugal.

The long term goals of the proposed Institute include:

- Develop an understanding of the structure of microbial communities and their dynamics in response to normal environmental variation and novel anthropogenic stresses through the use of modern and ancient microbial communities as experimental models.
- Develop and evaluate methods for the detection of human and other pathogens in dairy products resulting from environmental contamination;
- Assess the impact of chemicals and radiation on the evolution of microbial communities utilizing modern and ancient microbial communities;
sites that, by law, must be cleaned up. Estimates for the other water bodies is unknown, but the magnitude of the cleanup of Federal lands alone may be $450 billion. The development to potentiate the biodegrading activities of the specific waste materials at a given hazardous waste site. Genetic engineering techniques could also be implemented to potentiate the biodegrading activities of autochthonous microorganisms in contaminated sites.

Bioremediation is addressed as one example of an environmental biotechnology. Because the knowledge required for bioremediation is similar to that needed for the development of many other environmental biotechnologies, the research approach described here is likely to have wide application.

Bioremediation is a term for a number of microbiologically-based processes that degrade waste materials into harmless by-products such as water, carbon dioxide and various forms of salt. It is, in effect, using the same processes that take place when lawn or garden waste is composted to be later used as a soil nutrient for future planting. By identifying and isolating naturally-occurring bacteria or fungi that degrade specific substances, scientists are able to clone them, manufacture the organisms in large quantities and introduce combinations of microorganisms (bacteria, fungi, etc.) that will eliminate the specific waste materials at a given hazardous waste site. Genetic engineering techniques could also be implemented to potentiate the biodegrading activities of autochthonous microorganisms in contaminated sites.

The United States has a large number of identified polluted areas, including land, fresh water, and marine sites that, by law, must be cleaned up. Estimates for the cleanup of Federal lands alone may be $450 billion. The extent of contaminated non-Federal agricultural acreage, mining areas, industrial sites, and aquifers and other water bodies is unknown, but the magnitude of the problem is undoubtedly large and clean-up expenses could be astronomical. It has been estimated that cleanup of both Federal and non-Federal lands could cost $1.7 trillion using conventional approaches, which would produce noxious waste by-products and thereby impose additional clean-up or environmental costs.

Due to its comparatively low cost and generally benign environmental impact, bioremediation offers an attractive alternative and/or supplement to more conventional clean-up technologies. Bioremediation has been successful at many sites contaminated with petroleum products. However, it is not always the technology of choice because efficacy and the rate of degradation at any particular site cannot be predicted reliably. Improved predictive and process validation capabilities would help stimulate wider use of this technology. Research also could lead to development of biotechnologies to remediate areas contaminated by metals, pesticides, radioactive elements, other toxic materials, and mixed wastes.

These types of studies could be especially productive at this time. Recent developments in biology have provided new tools and approaches for monitoring the environment and engineering organisms with the capacity to degrade environmental pollutants. These developments have created unprecedented opportunities for significant advances. Indeed, bioremediation is expected to become an industry with annual sales of more than $500 million by the year 2000.

The United States is among several nations developing bioremediation technologies. Maintaining and enhancing the U.S. position in this arena will require continued investment in the generation of new knowledge needed for the development of new technologies. Investment in bioremediation research has the dual benefits of solving important environmental problems while stimulating the growth of the U.S. bioremediation industry.

The Environmental Biotechnology Institute at Cal Poly will accrue many benefits to both the University and to the citizens of the Central Coast of California. The environmental impact of oil and solvent spills that have plagued the Central Coast will be felt for hundreds of years. As a result environmental remediation efforts of the affected habitats will be required on a long-term basis. Cal Poly, with its "learn-by-doing" philosophy, can take advantage of this "natural laboratory" opportunity by engaging students and scientist mentors in this real-life situation. It will provide an infrastructure for scientists at Cal Poly, sharing common interests, for interdisciplinary research activities and soliciting extramural research funds. Our students will certainly benefit from their participation in the activities of the Institute in Senior Projects and other independent research activities by acquiring new techniques and experience, thereby
increasing their value to companies and communities facing similar situations in many places around the world. Additionally, this Institute will allow the affected communities on the Central Coast to experience the positive impact that joint efforts between business and academia can have on both the economy and the environment.

A major focus of the Institute will be to study microbial communities in terrestrial and aquatic ecosystems, both from present-day and ancient environments (such as those preserved in amber and other fossilized biopreserving materials) as well as those autochthonous of dairy products. The goal of these studies will be to assess the essential community composition of diverse environments and monitor the evolution of important microorganisms in those environments in response to environmental stimuli.

Additionally, genes of interest will be isolated and cloned and their nucleic acid sequences determined. These organisms, their genes, and genetic sequences will be stored and managed by the Institute in order to serve an important source of biological information to scientists throughout the world, and in particular investigators and students from laboratories in the CSU system. The purpose of these efforts would not only be to study the evolution of microbial communities and describe the microbial diversity, but also to develop new molecular methods for detecting pathogens, measuring microbial diversity, and to develop culture methods to recover and grow yet undiscovered microbes. These microorganisms, from ancient and contemporary ecosystems, will be evaluated for their potential in industrial applications such as bioremediation, production of novel and useful pharmaceuticals, and secretion of enzymes with various industrial applications. New assays, databases, and software to assess and describe such microbial diversity, as well as educational materials will be developed at the Institute. Whenever possible, the Institute will strive to patent and license its intellectual property.

Another major area of concern for the Institute will involve the characterization of contaminated sites to determine the feasibility of in situ as opposed to off-site remediation. Because in situ bioremediation involves the action of the indigenous microbial population, site characterization must include an evaluation of microbial diversity for the site in question. The molecular methods developed by the Institute for characterizing microbial communities and the microbial and genetic libraries created, can be used effectively in these studies.

Once the microorganisms involved are identified and the degradative pathways resolved, a consortium of microorganisms, both genetically altered and/or indigenous, can be assembled to more effectively remediate the site. The genetic enhancement of microorganisms, both ancient and isolated from contaminated sites for the purpose of producing a more efficient clean-up process will be another Institute focus requiring the expertise of faculty in the Cal Poly Biology and Chemistry Departments. These microorganisms will also be added to the microbial library of the Institute.

As with any remediation effort, an in situ bioremediation treatment must be followed by an evaluation of the "biological health" of the soil after treatment. Again the molecular methods developed at the Institute will help characterize the soil microbial communities before and after treatment. The Institute will also have the expertise of scientists in the Soil Sciences and Environmental and Civil Engineering Departments at Cal Poly to help develop post remediation therapies for decontaminated soils to restore their productivity.

Finally, the Institute will develop and analyze multiple approaches to the application of both in situ and off-site bioremediation processes. The application of bioremediation to a contaminated site is often an extremely site-specific process. Using the expertise of faculty members in the Cal Poly Colleges of Agriculture and Engineering, the Institute will study bioremediation applications and determine the unifying factors that may allow for a more standardized and easily utilized approach to remediating contaminated sites.

An overall training program for the Institute will tie these diverse disciplines together to form a coherent program. All of the skills and processes for site evaluation and remediation developed at the Institute will be made available for educational purposes and can be used to attract collaborations with businesses interested in acquiring skilled employees. In addition to training Cal Poly students, the Institute will serve as a training site for students and scientists from across California, the West, as well as internationally. Additionally, seminars and workshops will be regularly scheduled and a site on the world-wide web established to inform and educate the Central California community of the Institute's efforts and advances and as well as progress in environmental biotechnology.

If such a project is developed, Cal Poly could become the "Environmental Biotechnology Center of the West Coast". Undoubtedly, a large-scale program such as this would allow the parties involved access to many microorganisms and genetic systems from outside sources, making the Institute even more influential and productive. Moreover, a joint programs in various aspects of environmental biotechnology could be coordinated with programs elsewhere in the U.S., such as the University of Tennessee's Institute for Environmental Biotechnology or Michigan State University's Center for Microbial Ecology.

The Institute will be directed by Dr. Raul Cano, Biological Sciences Department and assisted by Dr.
FUNDING STRATEGIES:
There has been considerable activity related to the types of projects that will be sponsored by the Environmental Biotechnology Institute (EBI). Table 1 and Table 2 below summarize funded and pending grants and contracts since 1991. It is projected that the Environmental Biotechnology Institute would be self-supporting starting on year 3. Table 3 summarized the projected budget for the first five years of operation. Funds for the activities of the EBI will result from extramural funds in the form of grants, contracts, consultation fees, training workshops, and gifts.

**TABLE 1: Funded Grants and Contracts**

<table>
<thead>
<tr>
<th>YEARS</th>
<th>TITLE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>Microbial diversity indexing with HPLC technology</td>
<td>$68,000</td>
</tr>
<tr>
<td>1996-1998</td>
<td>Development and Standardization of a PCR-Based Rapid Assay for Spore Count Determination in Powder Milk</td>
<td>$120,238</td>
</tr>
<tr>
<td>1995-1997</td>
<td>Field testing of a PCR assay for Listeria monocytogenes in dairy products</td>
<td>$179,000</td>
</tr>
<tr>
<td>1995-1997</td>
<td>Detection of Salmonella in a fluorescence PCR-based assay for monitoring dairy herd health</td>
<td>$72,772</td>
</tr>
<tr>
<td>1995</td>
<td>Species Diversity in bacteria of using the 16S rRNA gene.</td>
<td>$85,000</td>
</tr>
<tr>
<td>1993-1996</td>
<td>Rapid detection of Listeria monocytogenes by FD-PCR.</td>
<td>$74,000</td>
</tr>
<tr>
<td>1993</td>
<td>Molecular phylogeny of stingless bees using amber-entombed specimens.</td>
<td>$59,950</td>
</tr>
<tr>
<td>1993</td>
<td>Molecular phylogeny of stingless bees using amber-entombed specimens.</td>
<td>$25,000</td>
</tr>
<tr>
<td>1991</td>
<td>Development of a Biotechnology Laboratory</td>
<td>$129,000</td>
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</table>

**TABLE 2: Pending Grants and Contracts**

<table>
<thead>
<tr>
<th>YEARS</th>
<th>TITLE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997-2000</td>
<td>Minority Biomedical Research Support Program.</td>
<td>$1,183,068</td>
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<tr>
<td>1997-1998</td>
<td>Model to study host/parasite relationship evolution.</td>
<td>$85,000</td>
</tr>
<tr>
<td>1997-1999</td>
<td>Calibration of molecular clocks.</td>
<td>$201,406</td>
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<tr>
<td>1997-1999</td>
<td>Monitoring microbial communities with molecular methods.</td>
<td>$75,000</td>
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<tr>
<td>1997-2000</td>
<td>Effect of micronutrients on bioavailability and microbial diversity.</td>
<td>$470,996</td>
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<tr>
<td>1996-2000</td>
<td>Authentication of ancient bacteria from amber inclusions using coalescent distributions of 16S rRNA and Adh haplotypes.</td>
<td>$201,146</td>
</tr>
<tr>
<td>ITEM</td>
<td>YEAR 1</td>
<td>YEAR 2</td>
</tr>
<tr>
<td>----------------------------------</td>
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<td>----------</td>
</tr>
<tr>
<td></td>
<td>CPSU</td>
<td>EBI</td>
</tr>
<tr>
<td>Director</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic year (release time)</td>
<td>- $4,572</td>
<td>$4,572</td>
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<tr>
<td>Summer</td>
<td>$3,530</td>
<td>$3,530</td>
</tr>
<tr>
<td>Associate Director</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic year (release time)</td>
<td>$3,949</td>
<td>$3,949</td>
</tr>
<tr>
<td>Summer</td>
<td>$3,949</td>
<td>$2,073</td>
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<tr>
<td>Visiting Scientist/Post Doctoral</td>
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<td>Student Assistant†</td>
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<tr>
<td>Clerical</td>
<td>$6,853</td>
<td>$6,853</td>
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<tr>
<td>Release time</td>
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<td>Equipment</td>
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<td>Supplies</td>
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<td>Travel</td>
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<td>$2,510</td>
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<tr>
<td>Lecture series</td>
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<tr>
<td>Initial start-up</td>
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<tr>
<td>TOTALS</td>
<td>$30,041</td>
<td>$102,043</td>
</tr>
</tbody>
</table>

*CPSU: Cal Poly funds requested

**Funds will be provided by Environmental Biotechnology Institute

†Scholarship funds to be made available by a corporate donor in behalf of EBI
These Bylaws are applicable within the authorization established by the Board of Trustees of the California State University (CSU) and the California Polytechnic State University (Cal Poly).

NAME:
The name of this organization shall be Environmental Biotechnology Institute, referred to in this Bylaws as the EBI.

MISSION:
To explore biotechnological approaches to problem-solving in various areas of environmental biotechnology through the use of microorganisms and their products.

To achieve this the Institute shall:
- Develop an understanding of the structure of microbial communities and their dynamics in response to normal environmental variation and novel anthropogenic stresses through the use of modern and ancient microbial communities as experimental models.
- Develop and evaluate methods for the detection of human and other pathogens in food/dairy products resulting from environmental contamination.
- Assess the impact of chemicals and radiation on the evolution of microbial communities utilizing modern and ancient microbial communities.
- Determine the biochemical mechanisms, including enzymatic pathways, involved in aerobic and anaerobic degradation of pollutants and disease-causing processes.
- Expand understanding of microbial genetics as a basis for enhancing the capabilities of microorganisms to degrade pollutants or to cause disease.
- Develop and evaluate “gene-delivery systems” for the dissemination of genetic traits among microbial communities in situ.
- As a standard practice, conduct microcosm/mesocosm studies of new bioremediation techniques to determine in a cost-effective manner whether they are likely to work in the field, and establish dedicated sites where long-term field research on bioremediation technologies can be conducted.
- Develop, test, and evaluate innovative biotechnologies, such as biosensors and genetic profiles, for monitoring bioremediation in situ and assessing the level of contamination in dairy and environmental samples.
- Involve graduate and undergraduate students from Cal Poly and other CSU campuses in the research activities of the Institute.
- Foster an active research program among its membership on problems best addressed through an integrated approach that applies the disciplines of chemistry, agriculture, engineering, physics, computational sciences and biology.
- Seek ways of improving the individual teaching performance of its members through interdisciplinary communication at all levels of instruction.
- Provide the infrastructure for the training of, and communication of ideas to the scientific and lay communities through publications, seminars, lectures, and workshops.

PURPOSE:
1. Direction
The President of California Polytechnic State University, San Luis Obispo, authorizes the establishment of the Environmental Biotechnology Institute, California Polytechnic State University (CPSU), for the purpose of promoting an atmosphere conducive to research, creative activity, education, and training in the areas molecular paleobiology, microbial ecology, molecular biology, and biotechnology.

2. Policies
The policies of the EBI shall be in accordance with the policies of the CSU and Cal Poly.

2. Dissolution
In the event that the EBI is dissolved, its assets remaining after payment of, or provision for payment of, all debts and liabilities shall be distributed equitably among the departments represented by the membership of the EBI.

MEMBERSHIP:
Appointments to the Institute shall be recommended to the President or his designee by the existing members. Candidates will be considered according to their individual abilities to contribute to the Institute within the guidelines of its particular purposes and functions.
1. The initial membership of the Institute shall be comprised of the Charter Members of the Institute. The Charter Members are:

Raúl J. Cano, Ph.D., Professor, Biological Sciences. (Director)
Christopher Kitts, Ph.D., Assistant Professor, Biological Sciences. (Associate Director)
Nirupam Pal, Ph.D., Assistant Professor, Civil & Environmental Engineering.
Thomas A. Ruehr, Ph.D., Professor, Soil Sciences.
Jeffrey G. Sczechowski, Ph.D., Assistant Professor, Civil & Environmental Engineering.
Douglas Williams, Ph.D., Professor, Agricultural Engineering.
Max Wills, Ph.D., Professor, Chemistry and Biochemistry.

2. Thereafter, individuals who hold full-time faculty positions at Cal Poly may be nominated for membership by the existing members. In general, the guidelines for such nomination shall be as follows:

a. The nominee shall have a demonstrated and continuing interest in scientific research.

b. The nominee shall show evidence of a background and research interest strongly oriented toward the biological, biotechnological sciences, chemical, physical sciences, or agriculture.

c. The nominee's previous research shall focus in areas of investigation that fall within the mission of the Institute.

3. A nominee shall be recommended for membership in the Institute by a two-thirds (2/3) vote of the voting membership, the election to be conducted by closed ballot.

4. Since it is recognized that a great variety of disciplines may be able to contribute to the Institute in a valuable manner, Associate Members may be nominated if their discipline is construed as a useful adjunct to molecular biology or biotechnology, even though their background does not fit the guidelines for full membership. Such nominees shall become Associate Members of the Institute by the same balloting procedure as is done for election of Members. An Associate Member will be a non-voting member, but will otherwise be a full participating member of the Institute.

STRUCTURE:
The organizational chart below summarizes the administrative hierarchy governing the Institute. It is the intent of the Charter Membership that the internal governance of the Institute be largely free of administrative hierarchy. However, it is recognized that some administrative structure is necessary, and for that reason the following shall be implemented.

1. The membership of the Institute, by closed ballot, shall elect a Director, whose general function shall be to exert leadership and such organization as shall be necessary to implement the purposes of the Institute. Election of the Director shall require a two-thirds (2/3) majority of the voting membership, and will be held in the last month of the academic year. His/Her term of office will be four (4) years, and he/she may be reelected.

2. The duties of the Director shall be general and in keeping with the intent of the office expressed above.

a. The Director shall call meetings, appoint committees when needed and coordinate the activities of the Institute as deemed necessary.

b. The Director shall maintain the files of the Institute and act as the liaison between the membership and the administration and any other outside agencies with which the Institute does business.

c. The Director will be the official signatory of the Institute on all official documents, such as research grant applications and letters pertaining to the entire membership.

d. In keeping with the philosophy of the Institute, the Director will strive at all times to keep administrative duties (both his own and those of the membership) at a minimum, on the assumption that time spent in administration is time lost for teaching and research. Within this context, all Members and Associate Members of the Institute agree to perform such administrative tasks as may be asked of them by the Director.

3. An Advisory Board shall be established and will consist of no more than ten individuals in Industry, Government, and Academia with the appropriate expertise and perspective. Nominations and final election to the Advisory Board shall be made by the members of the EBI. Nominations for the Advisory Board will be sought at the first meeting of the EBI.

4. Consultants and Collaborators will be sought to provide guidance in the various aspects associated with the mission and goals of the EBI. Consultants and collaborators are
Figure 1. Structure and Activities of the Environmental Biotechnology Institute

- Ancient DNA
- Ancient Microorganisms
- Microbial Detection Systems
- Microbial Diversity Assessment
- Microbial Activity Assessment
- Structural Chemistry
- Natural Product Discovery
- Genetic enhancement
- Repository of microorganisms (ancient and modern)
- Repository of genes & sequences
- Bioremediation Technique Development
- Consultation
- Workshops and lectures

* Faculty reporting lines will be within their respective Colleges
### TABLE 4: Consultants and Collaborators.

<table>
<thead>
<tr>
<th>NAME AND INSTITUTION</th>
<th>AREA OF EXPERTISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Javier Benedi, Ph.D.</td>
<td>Gene expression systems</td>
</tr>
<tr>
<td>University of Balearic Islands (UBI), Spain</td>
<td></td>
</tr>
<tr>
<td>Dolores Berber-Jiménez, Ph.D.</td>
<td>Structural chemistry</td>
</tr>
<tr>
<td>California Polytechnic State University</td>
<td></td>
</tr>
<tr>
<td>Keith A. Bostian, Ph.D.</td>
<td>Microbial diversity</td>
</tr>
<tr>
<td>COO, Microcide Pharmaceuticals</td>
<td>Natural product discovery</td>
</tr>
<tr>
<td>Ricardo Franco, Ph.D.</td>
<td>Protein structure and function</td>
</tr>
<tr>
<td>University of Portugal</td>
<td></td>
</tr>
<tr>
<td>Jorge Galazzo, Ph.D.</td>
<td>Natural product fermentations</td>
</tr>
<tr>
<td>Research Fellow, Microcide Pharmaceuticals</td>
<td>Recovery of microorganisms from soils</td>
</tr>
<tr>
<td>Edward E. Golenberg, Ph.D.</td>
<td>Molecular evolution</td>
</tr>
<tr>
<td>Wayne State University</td>
<td></td>
</tr>
<tr>
<td>Roger L. Gambs, Ph.D.</td>
<td>Animal biology</td>
</tr>
<tr>
<td>California Polytechnic State University</td>
<td>Biosafety</td>
</tr>
<tr>
<td>Jose Gil Sánchez, M.D.</td>
<td>Food Microbiology</td>
</tr>
<tr>
<td>University of Balearic Islands, Spain</td>
<td>Food manufacturing practices</td>
</tr>
<tr>
<td>V. L. Holland, Ph.D.</td>
<td>Chairman, Biological Sciences</td>
</tr>
<tr>
<td>California Polytechnic State University</td>
<td></td>
</tr>
<tr>
<td>Rafael Jiménez Flores, Ph.D.</td>
<td>Dairy Microbiology</td>
</tr>
<tr>
<td>California Polytechnic State University</td>
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</tr>
<tr>
<td>David J. Keil, Ph.D.</td>
<td>Plant taxonomy</td>
</tr>
<tr>
<td>California Polytechnic State University</td>
<td></td>
</tr>
<tr>
<td>Charles Kurland, Ph.D.</td>
<td>Genome evolution</td>
</tr>
<tr>
<td>Biomedical Center, University of Uppsala</td>
<td>Genetic analysis</td>
</tr>
<tr>
<td>Jorge Lalucat, Ph.D.</td>
<td>Microbial degradation of hydrocarbons</td>
</tr>
<tr>
<td>University of Balearic Islands, Spain</td>
<td>Chairman, Environmental Biology, UBI</td>
</tr>
<tr>
<td>Darryl A. Leon, Ph.D.</td>
<td>Protein structure</td>
</tr>
<tr>
<td>California Polytechnic State University</td>
<td></td>
</tr>
<tr>
<td>Anjos L. Macedo, Ph.D.</td>
<td>Protein structural analysis</td>
</tr>
<tr>
<td>University of Portugal</td>
<td>Nuclear Magnetic Resonance</td>
</tr>
<tr>
<td>José Carlos Palomares, M.D., Ph.D.</td>
<td>Molecular diagnostics</td>
</tr>
<tr>
<td>University of Sevilla, Spain</td>
<td></td>
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<tr>
<td>Norman Pieniazek, Ph.D.</td>
<td>Molecular Evolution</td>
</tr>
<tr>
<td>Centers for Diseases Control</td>
<td>Nucleic acid analyses</td>
</tr>
<tr>
<td>Thomas L. Richards, Ph.D.</td>
<td>Biohazardous material handling</td>
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<tr>
<td>California Polytechnic State University</td>
<td>Scholarships</td>
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<tr>
<td>Franco Rollo, Ph.D.</td>
<td>Ancient DNA analysis</td>
</tr>
<tr>
<td>University of Camerino, Italy</td>
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</tr>
</tbody>
</table>
eligible for membership in the EBI and shall be subject to the guidelines in parts 2 and 3 of this section. The EBI has, at the present time, a list of Consultants and Collaborators (Table 5) whose expertise has been sought or will be sought in anticipated future projects.

FISCAL POLICIES

1. Fiscal Year
   The fiscal year shall be in accordance with the University.

2. Accounts and Audits
   The books and accounts of the EBI shall be kept by the Cal Poly Foundation in accordance with sound accounting practices, and shall be audited annually in accordance with University Policies.

3. Peer Review
   The EBI shall be subject to peer review every five years in accordance with Administrative Bulletin 87-3 of Cal Poly.

ACTIVITIES:

Since one of the prime purposes of the Institute is to foster interdisciplinary cooperation among its Members and Associates, it is therefore assumed that joint projects involving two or more of the membership will be highly encouraged. In order to facilitate this kind of cooperation, it shall be a standing function of the Institute to carry out the following projects and functions:

1. Seminar Series
   The Institute shall sponsor a continuing seminar series which shall involve the membership, their graduate students and outside research persons as speakers. It is also the goal of the Institute to establish a Distinguished Lectureship in Microbial Ecology, patterned after the Robbins Lectureship at Claremont College, to attract Nobel status scientists to CPSU.

2. Research Grants
   The Institute shall actively seek outside research grant support for its activities. These efforts may be initiated by one or more members, either alone or with non-members as collaborators, on behalf of the Institute as a whole. It is hoped, but it is by no means necessary, that proposals be initiated in the name of the Institute and that internal review take place prior to submission.

3. Solicitation of Additional External Support
   A major goal of the Institute is to obtain outside funding to promote microbial ecology, bioremediation, and biotechnology at CPSU. This shall include developing proposals for a graduate training program in Molecular Biology and Biotechnology, equipment grants, and specialized seminar series.

4. Publications
   The membership will be actively encouraged to publish the results of their researches, individually or collectively. It is suggested that when this is done that the following format be employed:

   Name(s):
   Environmental Biotechnology Institute,
   Department of ___________

   The Director of the Institute shall maintain a file of copies of all publications of the Institute, and shall be responsible for assigning each with a number. In addition, the Director will submit an Annual Report of the Institute to the Vice President, Academic Affairs through the Dean of Research and Graduate Studies.

5. Consultation
   The Institute shall serve as an entity to advise and be consulted by the administration and the community on affairs relative to the molecular sciences and biotechnology. The Institute will be concerned with future hiring patterns, and it shall feel free to make recommendations to the administration relative to research and teaching in the molecular biological sciences and biotechnology.

6. Repository of Microorganisms and Genes
   The Institute shall represent a repository of ancient microorganisms, genes, and nucleic acid sequences. The Institute will also serve as a repository of microorganisms obtained from modern habitats rich in biodiversity with bioactive properties. These will be available at no cost to the scientific community at large, in particular collaborating laboratories in the CSU system for the purpose of studying biological processes, or other basic research activities. The Institute shall retain all rights to microorganisms, genes, nucleic acid sequences and their products for commercialization purposes. Licenses and rights will be granted to interested parties on an individual basis and only after negotiations with the Institute, California Polytechnic State University, and the California Polytechnic State University Foundation, as appropriate.
7. **Teaching**
The membership of the Institute shall be encouraged to make use of state-of-the-art technology and pedagogical devices in the various classes taught by them, utilizing the resources of the Institute to enrich these courses.

8. **Institute for Applied Biotechnology Brochure**
The Institute will communicate its existence annually and distribute a formal brochure to appropriate undergraduate departments at various institutes of higher learning to attract students to CPSU for graduate research in the molecular biological sciences and biotechnology.

9. **Master's Degree in Special Major**
The Institute will collaborate with the appropriate Department(s) to establish a multidisciplinary Masters Degree Program in a Special Major entitled "Molecular Biology and Biotechnology."

10. **Ph.D. Program in Special Major**
The Institute will attempt to establish and co-administer a Ph.D. Degree in a Special Major in collaboration with the University of California and other Ph.D.-Granting Institutions in the US and Abroad.

**LOCATION:**
The Institute will initially be housed in Fisher Science Hall, on the Cal Poly campus. The basic infrastructure for the isolation, cultivation, characterization, and genetic manipulation of the organisms from fossilized materials (e.g., amber) deep ocean cores, and contaminated sites, is already in place, requiring only additional equipment, supplies and personnel to meet the expected research and training needs. Classroom and laboratory space for training courses are available and will be reserved for use in workshops and scientific meetings. It is also anticipated that the Institute will sponsor scientific meetings and symposia on the Cal Poly campus.

**AMENDMENTS**

1. **Amendments**
The Bylaws may be amended by a 2/3 vote of the membership voting at any meeting of the EBI. Each member shall have at least one week advanced written notification of the proposed amendment(s).
To: Executive Committee  
of the Academic Senate

From: GEB Ad Hoc Committee  
      John Hampsey (Chair), Phil Bailey, John Connelly, Glenn Irvin  
      Steve Kaminaka, and Paul Murphy

Subject: Final GEB Governance and Template Proposals

Please find accompanying this memo our final proposals for a General Education and Breadth governing structure and template as charged to our committee by the Academic Senate Executive Committee. We suggest the proposals be agendized as soon as possible to allow, if they are approved by the Senate, the formation of the governance structure prior to the end of this academic year.

Our 3/25/96 draft proposals were distributed to the campus and generated much discussion and more than 60 responses. We have attempted to address the issues raised by the Cal Poly community in our revised proposals and wish to offer additional explanation and suggestions in this memo.

1. Governance Structure: We have changed our proposal to allow for election of board members; to ensure that there are two members from the College of Liberal Arts, two from the College of Science and Mathematics (which will include the UCTE in its unit for purposes of the governance structure) and two from the professional colleges (Agriculture, Architecture, Business, and Engineering with no more than one board member from a single college); and to make the term of the director three years rather than five.

Our concept of the governance structure creates an academic unit to administer the GEB program just as departments administer individual degree programs. This unit is two-thirds composed of faculty members from the Colleges of Liberal Arts and Science and Mathematics because the academic composition of the program largely involves courses from these colleges. It is reasonable to have such an organizational unit responsible for the content and quality of GEB
since this program composes at least one-third of the degree requirements of Cal Poly students. The governance structure will ensure that initiative, innovation, and accountability abound in our GEB program; departments offering academic programs will have a place to voice concerns and propose ideas. The governance structure does not usurp the responsibilities of the Academic Senate in curriculum. Any new courses and substantial changes to existing courses proposed by departments must go through the curriculum review process of the Academic Senate. Likewise, any programmatic changes or innovations proposed by the governing board to the vice-president will be submitted, by the vice-president, to the Academic Senate for timely consultation; the method in which the Academic Senate considers this consultation is its choice. The governance structure gives the GEB program, the core of Cal Poly’s curriculum, an academic/administrative home, much like that of our degree programs.

2. The GEB Template: The proposed four-unit course GEB template is intended as a guide to account for the manner in which credit units satisfy the requirements of CSU Executive Order 595; it is not a program in itself. The general education program may take several forms; it may include courses that satisfy more than one area simultaneously, it may include upper-division courses that address writing and critical thinking, it may have a series of core courses in the history of ideas. There may be more than one "track" or pathway to satisfy GEB requirements. Some of these possibilities are already under discussion: both the Liberal Studies program and the new University Honors Program have developed a series of interdisciplinary, team-taught courses that would satisfy much of the GEB requirement. Others have suggested integrated courses that present mathematics, science, and technology together.

Not surprisingly, our ad-hoc committee has discussed a variety of ideas that we hope eventually to share with the governing board and interested departments. However, it was neither our charge, nor would it have been reasonable, to have proposed massive changes to the GEB program in either content or structure; that should be the challenge of the university community in concert with the governing board, academic senate, and university administration. To clarify this, and in response to campus concerns, we have revised our template to more clearly appear as it should, a guideline for the construction of an innovative and flexible GEB program that addresses the premises of Executive Order 595. The proposed template now is organized into four areas, each described with the summary wording found Executive Order 595. It displays the Cal Poly technology elective and GEB elective separately.

We anticipate that the GEB Governing Board will call for courses, course sequences, templates, and programs to fulfill the general education requirements and we expect that the proposed template will act as an initial and flexible guide.
3. Further Ideas for the Cal Poly Community

A. Information Competency and Information Technology: We recommend that information competency and information technology be an educational outcome of the Cal Poly education and that they be infused throughout the curriculum as are written and verbal communication. Cal Poly graduates should be able to access, analyze, and productively utilize a variety of forms of information relevant to any topic under consideration. This capability touches all disciplines and is increasingly a central issue of undergraduate education. In addition to requiring familiarity with information technology and computing, information competence involves such skills as: (1) formulating and stating problems and issues within the conceptual framework of a discipline so others can readily understand and cooperatively engage in the search; (2) determining information requirements, formulating and implementing a search strategy; (3) locating and retrieving relevant information using appropriate technological tools; (4) organizing information to permit analysis, evaluation, synthesis, and understanding using appropriate technological tools; (5) creating and communicating information effectively using various media; (6) understanding the ethical, legal, and socio-political issues surrounding information and information technology; and (7) understanding the techniques, points of view, and practices employed in the presentation of information including the mass media. Information competence is an essential element in providing graduates the capability for self-guided, life-long learning.

B. U.S. Cultural Pluralism and Internationalization: Cal Poly graduates should be able to understand and function in an increasingly multicultural, multiracial, and international environment. To the extent possible, students should be able to complete the U.S. Cultural Pluralism requirement through course work in general education. In addition, international topics need to be addressed appropriately throughout the general education program. Experience and understanding of cultural pluralism and internationalization encourage among Cal Poly's graduates a tolerance for, and support of, constructive ideas, attitudes, and behaviors that differ from their own.

C. Writing Across the Curriculum: Cal Poly graduates should be able to communicate effectively with others orally, visually, and in writing. Requiring composition courses and an upper-division writing examination are not adequate to accomplish this goal. Developing skill in written communication requires regular practice and needs attention not only in general education but in the major as well. Writing should be required throughout the courses satisfying general education as appropriate to the subject. This does not mean that every course should include essays and
papers, but students' writing ability should be attended to where appropriate and possible. Nearly every discipline can use writing as a pedagogical strategy to encourage greater understanding of the subject (for example, in explaining the process for solving problems, in reporting the results of observations and experiments, and in communicating with others).

D. Upper-Division and Campus Residency Requirement: Executive Order 595 requires all students to complete 12 quarter units in residence on the campus offering the degree, and to complete 12 upper division units of general education. For practical purposes, these requirements are handled simultaneously by making the upper-division units the same as the units to satisfy the residence requirement. This proposal recommends that the upper-division residence requirement be satisfied throughout the general education program. Further, the faculty is encouraged to propose upper-division clusters of courses addressing topics appropriate to general education.

E. Technological Literacy: All Cal Poly graduates should have a sound understanding of science and technology, and where that is not part of the major, the general education program should require the study. This knowledge of science and technology reflects the unique character of the university and is the special stamp of its graduates. The Technology Elective address this requirement, but the Ad Hoc Committee believes it must be addressed even beyond the general education program. We believe this goal can best be addressed through minors and concentrations focused on technology. As the campus restructures the curriculum based on 4-unit courses, reduces the number of units required for the bachelor's degree, and reduces required courses, those programs in the liberal arts and sciences in particular should include enough free electives or program-approved electives in the major to permit students to take a minor in a technology related subject. Professional and technical programs should develop minors (16-20 units) that are accessible and useful to students in basic arts and sciences.
RESOLVED: That the Academic Senate of Cal Poly approve the administrative structure of the General Education and Breadth Program as outlined in the attached document.
Conceptual Goals of the General Education and Breadth Program

The California State University requires General Education and Breadth programs designed to assure graduates have made noteworthy progress toward becoming truly educated persons and provide means whereby graduates will have:

A. the ability to think clearly and logically, to find information and examine it critically, to communicate orally and in writing, and to reason quantitatively;

B. appreciable knowledge about their own bodies and minds, about how human society has developed and how it now functions, about the physical world in which they live, about the other forms of life with which they share the world, and about the cultural endeavors and legacies of their civilizations;

C. an understanding and appreciation of the principles, methodologies, value systems, and thought processes employed in human inquiries.

It is the ultimate aim of the program that the habits of thought and discussion, of engaging one's curiosity, creativity, and penchant for discovery, and of inquiry and learning, nurtured in Cal Poly's GEB program, will persist throughout the lives of all students.

Responsibility for the General Education and Breadth Program

Cal Poly's General Education and Breadth program is the administrative responsibility of the GEB Governing Board. After appropriate consultation with affected units, the board will make programmatic recommendations directly to the Vice-President for Academic Affairs. The vice-president will forward the proposals to the Academic Senate for consultation and timely response and consult with the academic deans as necessary prior to making final recommendations to the university president. Final decisions are the responsibility of the university president.
RESOLVED: That the Academic Senate of Cal Poly approve the Proposed General Education and Breadth Four Unit Template as outlined in the attached document.

Proposed by the GEB Ad Hoc Committee
April 16, 1996
PROPOSED GENERAL EDUCATION AND BREADTH FOUR UNIT TEMPLATE
(4/16/96 Proposal)

AREA I COMMUNICATION 12 UNITS
Communication in the English language, to include both oral communication and written
communication, and in critical thinking, to include consideration of common fallacies in
reasoning.

AREA II SCIENCE AND MATHEMATICS 16 UNITS
Inquiry into the physical universe and its life forms, with some immediate participation in
laboratory activity, and into mathematical concepts and quantitative reasoning and their
applications.

AREA III ARTS AND HUMANITIES 16 UNITS
Study among the arts, literature, philosophy, and foreign languages.

AREA IV SOCIAL, POLITICAL, AND ECONOMIC INSTITUTIONS 20 UNITS
AND HUMAN LIFE DEVELOPMENT
Study dealing with human behavior and human social, political, and economic institutions and
their historical backgrounds, and study designed to equip human beings for lifelong
understanding and development of themselves as integrated physiological and psychological
entities.

TECHNOLOGY ELECTIVE 4 UNITS
Study into how technology influences, and is influenced by, today's world.

GEB ELECTIVE 4 UNITS
For students majoring in science-based curricula, one additional course in arts and
humanities (Area III).
For students majoring in non-science based curricula, one additional course in science and
mathematics (Area II).
High unit professional degree programs (above 198) may propose to have these units apply to
any of the five areas.

* At least 12 units must be upper division.
* All courses must be letter graded.
* All courses must have a writing component as appropriate.
* Information competency and technology should be an educational outcome of the
  university curriculum.

TOTAL 72 UNITS
Background Statement: It is becoming increasingly apparent that information competence is a bedrock skill for all college students. This is the ability to find, evaluate, use, and communicate information in all of its various formats [Information Competence in the CSU, A Report submitted to the Commission on Learning Resources and Instructional Technology, December 1995].

WHEREAS, It is a primary responsibility to foster such skills among the students as Cal Poly; and

WHEREAS, These skills should be acquired at different levels of competence in relation to entering students, continuing college students, and graduating students; and

WHEREAS, Such skills need to be integrated into all levels of instruction, both vertically and horizontally as regards the curriculum; and

WHEREAS, Such integration is beyond the purview of any single major or the General Education and Breadth program; therefore,

RESOLVED: That entering students be required to meet basic information competence skills, that continuing college students be required to meet university level information competence skills, and that graduating students be expected to meet advanced information competence skills related to their majors; and, be it further

RESOLVED: That a university-wide committee be formed to make recommendations on appropriate skill levels and implementation methods for entering students and continuing college students. The recommendations will be forwarded to the Vice President for Academic Affairs, the Academic Senate, and the GE&B Committee; and, be it further

RESOLVED: That the university-wide committee encourage each major to develop and forward a list of skills and knowledge relating to the informational competence appropriate for its graduating students; and, be it further
RESOLVED: That the members of the university-wide committee shall represent the key divisions of the university involved with information competence as follows:
1. one faculty member from each college
2. one librarian
3. a faculty member from the University Center for Teacher Education (UCTE)
4. a representative from Information Technology Services
5. a designee of the Vice President for Academic Affairs;

and, be it further

RESOLVED: That the university-wide committee submit an annual report on the university's status concerning the three levels of informational competence to the following:
1. the Chair of the Academic Senate
2. the Vice President for Academic Affairs
3. the deans of the individual colleges
4. the Director for the University Center for Teacher Education
5. the Dean of Library Services
6. the Director for Information Technology Services

Proposed by the Computer Literacy Subcommittee
April 23, 1996
Proposed Amendment to the Proposed Administrative Structure
(4-16-96 draft) for General Education and Breadth
Drafted and Proposed by Chuck Dana, CENG Caucus Chair

Background

From early on I have thought and I had hoped that the ad hoc committee would come up with some structure to allow the two (or more?) cultures on campus to be brought together in solving the GE&B issue.

This proposed Governing Board does nothing of the sort, but rather sets up a system with no checks on the power of the Governing Board. Nobody needs to work together beyond the Colleges of Liberal Arts and Science and Math.

I think we have to have a series confidence-building steps to get over the animosity and distrust and outright ridiculous rumors that exist.

We must get the two sides talking to each other in a context that they must work together to reach a solution and to allow space for some creative solutions to the problems some majors face with the current GE&B structure. As a first step to that end, I plan to propose the following amendment to the procedures before us. I would appreciate your comments and suggestions.

My proposed amendment:

To add a section to the 4-16-96 draft of the Administrative structure:

College Option
1. A College upon the vote of its faculty and with the approval of its Dean may choose to establish a GE&B policy and approved courses for that College, within the categories defined by the GE&B Governing Board in their GE&B template.

2. The form and details (including approved courses) of the College’s GE&B program must be approved by BOTH
   a. The college curriculum committee or a separate college faculty committee established for the purpose of GE&B.

   AND

   b. The campus GE&B Governing Board, with any member from the college making the request not voting.

3. If these two committees cannot reach an agreement, the President will mediate the disputes until a mutually agreeable program is defined.

4. Monitoring of the approved courses for quality and agreement with guidelines, will be done by both committees.

4/30/96
Benefits of this proposal

Item 2 is the linchpin of this proposal. Will these committees fight? Maybe, but I actually think much less than you might imagine. The professional colleges’ needs and goals are NOT all that far removed from those of the GE&B departments; in my mind, the differences are mainly in amounts, efficiency, and quality of the program. This WILL then build trust because neither side needs to fear creativity in establishing a GE&B program because both the Governing Board and the college have a veto over the other. Are you afraid the Governing Board will only approve useless courses as a featherbedding make-jobs project for their own departments? The college has a veto. Are you afraid the engineers will define the mathematical formulas of thermodynamics as literature? The Governing Board has a veto. As they start working together, and they will have to, trust in each other will start building.

This arrangement can also foster creative solutions such as joint courses to efficiently implement the skills and experiences we want the students to have. (For example, joining a technical writing class to a lab class with extensive lab writeups). Or maybe an ethics course team taught by an engineer and a philosopher. Our goal should be what experiences and abilities we give to our students, not the number of units in various categories. If we can present equivalent experiences and abilities more efficiently, we should.

It provides a venue for the customers, the professional colleges, to express their views about low-quality courses (for example, scantron-tested humanities courses) and a mechanism where they can influence the upgrading of that quality.