

CAL POLY

Academic Senate

805.756.1258

<http://academicsenate.calpoly.edu/>

Meeting of the Academic Senate

Tuesday, March 10, 2015

UU 220, 3:10 to 5:00pm

- I. **Minutes:** none.
- II. **Communication(s) and Announcement(s):**
- III. **Reports:**
 - A. Academic Senate Chair:
 - B. President's Office:
 - C. Provost:
 - D. Vice President for Student Affairs:
 - E. Statewide Senate:
 - F. CFA:
 - G. ASI:
- IV. **Consent Agenda:**
 - A. Proposal to decouple the General Engineering Program from the Biomedical Engineering Department
 - B. ARCE 476 – Architectural Engineering Building Systems
- V. **Business Item(s):**
 - A. **Election of officers for 2015-2016**
 - B. **Resolution on Changes to the Bylaws of the Academic Senate:** Gary Laver, Academic Senate Chair, first reading (pp. 2-6).
 - C. **Resolution on Information Request About Contract Ratification Votes:** Manzar Foroohar, Statewide Senator, first reading (p. 7).
 - D. **Resolution on Changes in Academic Senate Grants Review Committee Membership and Responsibilities:** Jeanine Scaramozzino, chair of Grants Review Committee, first reading (pp. 8-10).
 - E. **Resolution on Approving Assessment Process for Courses Meeting Sustainability Learning Objectives:** David Braun, chair of Sustainability Committee, first reading (pp. 11-27).
 - F. **Resolution on Proposed New Degree Program: Bachelor of Science in Marine Sciences:** Nikki Adams, Biological Sciences Department, first reading (pp. 28-39).
- VI. **Discussion Item(s):**

[TIME CERTAIN 4:30 PM] NR 264: Natural Resources Economics, GE D2, not recommended for approval (p. 40).
- VII. **Adjournment:**

Adopted:

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

AS-__-15

**RESOLUTION ON CHANGES TO THE
BYLAWS OF THE ACADEMIC SENATE**

RESOLVED: That the Bylaws of the Academic Senate be modified as shown on the attached copy.

Proposed by: Academic Senate Executive Committee
Date: December 30, 2014
Revised: January 7, 2015

CHANGES TO THE BYLAWS OF THE ACADEMIC SENATE

1— Page 10

IV. OFFICERS

A. OFFICERS POSITIONS

3. Secretary

The Secretary or designee shall record the minutes of all Senate and Executive Committee meetings and shall provide copies of these minutes to all senators in the case of Senate meetings and to all Executive Committee members in the case of Executive Committee meetings. The Secretary or designee shall provide written notice of meetings to the appropriate faculty and shall handle correspondence of the Academic Senate. The Secretary or designee shall create ~~three copies~~ a paper copy of the minutes of all meetings ~~one for the Chair, one to be passed to the library, and one to be filed in the Academic Senate office and a digital copy to be filed with DigitalCommons and posted on the Academic Senate website.~~ The Secretary shall have available at each Senate meeting a current file of the actions of the Senate and a copy of the constitution and bylaws.

RATIONALE: Wording change to conform Bylaws to present practice.

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VIII. COMMITTEES

H. COMMITTEES

2. Curriculum (and its subcommittees: Curriculum Appeals Committee, ~~Graduate Programs Subcommittee, and U.S. Cultural Pluralism Subcommittee~~)

RATIONALE: Subcommittee was dissolved on 10.29.13 by resolution AS-770-13.

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VIII. COMMITTEES

I. COMMITTEE DESCRIPTIONS

1. Budget & Long-Range Planning Committee
 - (a) Membership

Ex officio members shall be the Provost/Vice President for Academic Affairs or designee, the Vice President for Administration and Finance or designee, and an ASI representative.

RATIONALE: Editorial change to conform to unit name.

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VIII. COMMITTEES

I. COMMITTEE DESCRIPTIONS

2. Curriculum Committee

(a) Membership

College representatives shall be either the current chair or a current member of their college curriculum committee. The Professional Consultative Services representative shall be an academic advisor from one of the colleges. Ex officio members shall be the ~~Provost/Vice President for Academic Affairs~~ Associate Vice Provost for Academic Programs and Planning or designee, the ~~Dean of Research~~ Director of Graduate Education or designee, the Vice Provost for Information Services/Chief Information Officer or designee, a representative from the Office of the Registrar, and an ASI representative.

RATIONALE: Academic Senate Curriculum Committee membership formally includes ex officio graduate representation via the Director of Graduate Education.

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VIII. COMMITTEES

I. COMMITTEE DESCRIPTIONS

2. Curriculum Committee

(b) Responsibilities

Graduate Programs Subcommittee

~~There will be a standing subcommittee of the Academic Senate Curriculum Committee responsible for the review of proposals for new/revised graduate courses and programs. The Graduate Programs Subcommittee shall not be comprised of a subset of the Curriculum Committee members, but instead, the subcommittee shall include one faculty member from each college with experience in graduate level teaching and supervision, the chair of the Academic Senate Curriculum Committee (or a designee of the chair), and as an ex officio member, the Dean of Research. The Graduate Programs Subcommittee will forward recommendations regarding graduate courses and programs to the Academic Senate Curriculum Committee, which will consider them before making its recommendations to the Academic Senate.~~

RATIONALE: Subcommittee was dissolved on 10.29.13 by resolution AS-770-13.

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VIII. COMMITTEES

I. COMMITTEE DESCRIPTIONS

3. Distinguished Scholarship Awards Committee

(a) Membership

General Faculty representatives should include former recipients of the Distinguished Scholarship Award. Ex officio members shall be ~~the Dean of Research~~ one representative, from the Office of Research, appointed by the Provost/Vice President for Academic Affairs and two ASI representatives—one undergraduate and one graduate student.

RATIONALE: Editorial change to conform to unit name.

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VIII. COMMITTEES

I. COMMITTEE DESCRIPTIONS

4. Distinguished Teaching Awards Committee
(a) Membership

General Faculty representatives should be former recipients of the Distinguished Teaching Award. If no prior Distinguished Teaching Award recipients from a particular college are available and willing to serve, the Executive Committee in consultation with the Distinguished Teaching Awards Committee chair may appoint a faculty member from that college who has a clear and compelling record of sustained, outstanding instructional performance. Ex officio members shall be ~~the Dean of Research and Graduate Programs~~ and two ASI representatives. These will have at least junior standing and will have completed at least three consecutive quarters and 36-quarter units at Cal Poly with at least a 3.0 grade point average.

RATIONALE: Earlier versions of Bylaws didn't have this position as an ex officio member.

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VIII. COMMITTEES

I. COMMITTEE DESCRIPTIONS

7. General Education Governance Board
(a) Membership

(2) The GEGB will also include one representative from the Office of the Registrar (ex officio, nonvoting) and one representative from Academic Programs and Planning (ex officio, nonvoting).

RATIONALE: Editorial change to conform to unit name.

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VIII. COMMITTEES

I. COMMITTEE DESCRIPTIONS

9. Instruction Committee
(a) Membership

Ex officio members shall be the Provost/Vice President for Academic Affairs or designee, ~~the Vice Provost for Information Services/Chief Information Officer or designee~~, a representative from CTLT, a representative from the Office of the Registrar, and an ASI representative.

RATIONALE: With CTLT's move to Academic Programs and Planning, Information Services does not have anyone appropriate to serve on this committee.

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VIII. COMMITTEES

I. COMMITTEE DESCRIPTIONS

11. Sustainability Committee

(a) Membership

Ex officio members shall be the Provost/Vice President for Academic Affairs or designee, the Vice President for Administration and Finance or designee, Ex officio members shall be the Associate Vice Provost for Programs and Planning or designee, the Director of Facilities Planning or designee, the Manager Associate Director of Sustainable Energy and Utilities, one academic dean or Associate Dean, and two ASI representatives.

RATIONALE: Editorial change to conform to unit name.

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VIII. COMMITTEES

I. COMMITTEE DESCRIPTIONS

11. Sustainability Committee

(b) Responsibilities

The Sustainability Committee shall inform and support the activities of other committees who scope encompasses environmental responsibility. The Sustainability Committee shall make recommendations to the Academic Senate, as appropriate, regarding the provisions of the Talloires Declaration (AS-622-04) and the CSU Sustainability Policy.

RATIONALE: Clarification of responsibilities.

Adopted:

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

AS-___-15

**RESOLUTION ON INFORMATION REQUEST ABOUT CONTRACT
RATIFICATION VOTES**

1 WHEREAS, The Academic Senate and the California Faculty Association (CFA) are the two
2 main representatives of the CSU faculty; and
3

4 WHEREAS, As faculty, we always stand for, and teach our students the value of transparency
5 and democracy; and
6

7 WHEREAS, The CFA statewide leadership has refused to respond to repeated requests from
8 the faculty to share information on the recent ratification vote of the new contract;
9 therefore be it
10

11 RESOLVED: That the Cal Poly Academic Senate urge the statewide CFA leadership to respond
12 to the faculty requests for detailed information on voting results (i.e., breakdown
13 of votes for each campus and by different categories of faculty such as
14 tenured/tenure track vs. non-tenure); and be it further
15

16 RESOLVED: That the Academic Senate urge CFA statewide leadership to commit to the
17 principles of transparency and meaningful consultation with union members in
18 future negotiations and in the overall management of union affairs; and be it
19 further
20

21 RESOLVED: That this resolution be distributed to the ASCSU Executive Committee, campus
22 Senate chairs, CFA statewide Board of Directors, and CFA chapter presidents.

Proposed by: Academic Senate Executive Committee
Date: January 30, 2015

Adopted:

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

AS-__-15

RESOLUTION ON CHANGES IN ACADEMIC SENATE
GRANTS REVIEW COMMITTEE MEMBERSHIP AND RESPONSIBILITIES

Background:

During fall quarter 2014, the Academic Senate asked the Grants Review Committee to review the Bylaws of the Academic Senate to reflect any revisions or changes to campus policies surrounding the committee and provide any recommendations for change to the Senate office by spring 2015. In response to this charge, the Academic Senate Grants Review Committee has recommended the following modifications in the selection of its membership, the members of the committee, and its responsibilities.

1 WHEREAS, The Chancellor's Office guidelines for their Research, Scholarship, and
2 Creative Activity funds state, that the majority of the committee membership
3 developing the plan for the distribution of funding "shall be elected faculty
4 members elected by the probationary and tenured faculty or who shall be
5 members of an existing elected committee." Current practice does not
6 conflict with this statement; and
7

8 WHEREAS, The Grants Review Committee is the only committee that is listed as
9 following Bylaws section III Voting and Election Procedures for the *election*
10 of committee members. The current practice on campus is the appointment
11 of committee members, like all other standing committees, as outlined in
12 Bylaws section VIII.B: "During spring quarter, each caucus shall convene to
13 nominate candidates from that college or Professional Consultative Services
14 to fill committee vacancies occurring for the next academic year. These
15 nominations shall be taken to a meeting of the Executive Committee before
16 the June regular meeting of the Senate. The Executive Committee shall
17 appoint members to standing committee vacancies from these lists."
18 Additionally, the current practice of the membership since 2008 [AS-671-
19 08] is that the Grants Review Committee shall include one voting General
20 Faculty representative from each college and Professional Consultative
21 Services, and a graduate student ASI representative and the Dean of
22 Research or designee as ex officio members; and
23

24 WHEREAS, The responsibilities have been reworded to allow for the regularly evolving
25 nature of grant programs, grant funding, and the like, and to reflect
26 additional responsibilities that have been given to the committee but are not
27 reflected in the current Bylaws of the Academic Senate, therefore be it
28

29 RESOLVED: That to accurately reflect the practices of the Academic Senate we suggest:
30 The removal of the mention of the Grants Review Committee from Bylaws of
31 the Academic Senate I.B.8.C, III, and IX.A.4, and the rewording of VIII.I.8.a
32 Membership and VIII.I.8.b. Responsibilities AS INDICATED IN THE
33 ATTACHMENT.

Proposed by: Grants Review Committee
Date: February 19, 2015

**ATTACHMENT TO
RESOLUTION ON CHANGE IN ACADEMIC SENATE
GRANTS REVIEW COMMITTEE MEMBERSHIP**

REMOVE

I. INTRODUCTION

B. DEFINITIONS

8. Voter Eligibility

Voting members of the General Faculty as specified in Article I of the constitution are eligible to vote for:

(a) senators from colleges or Professional Consultative Services.

(b) CSU academic senators.

~~(c) members to the Grants Review Committee.~~

~~(d)~~ (c) consultative committees as needed.

III. VOTING AND ELECTION PROCEDURES

Elections shall be held for membership to the Academic Senate, Senate offices, Academic Senate CSU, ~~Grants Review Committee~~, appropriate recall elections for the preceding as per Section IX of these bylaws, and ad hoc committees created to search for such university positions as president, provost, vice presidents, college deans, and similar type administrative positions.

IX. RECALL OF ELECTED REPRESENTATIVES

A. APPLICATION

The procedures for recall shall apply to:

1. Elected members of the Academic Senate, California Polytechnic State University;

2. Officers of the Academic Senate, California Polytechnic State University;

3. Elected representatives to the Academic Senate, California State University;
and

~~4. Members to the Grants Review Committee.~~

REWORDING

VIII. COMMITTEES

I. COMMITTEE DESCRIPTIONS

8. Grants Review

(a) Membership

- (1) ~~Pursuant to the Chancellor's Office guidelines for the State Faculty Support Grants (SFSG), [AA-2006-25], a majority of the membership shall consist of elected faculty members elected by the probationary and tenured faculty. Pursuant to AS-XXX-15, Resolution on Change in Academic Senate Grants Review Committee Membership Election (Bylaws section VIII.I.8.(a)(1) the Academic Senate Executive Committee appoints the voting members of the committee.~~
- (2) Ex officio members shall be the Dean of Research or designee and an ASI representative. The ASI representative must be a graduate student.
- (3) No member of the Grants Review Committee is eligible to apply for any grant, leave, or award program administered by the committee while serving on the committee.

(b) Responsibilities

- ~~(1) In coordination with the Research, Scholarship and Creative Activities Committee, the Grants Review Committee shall develop and recommend policies and procedures for the review of grant proposals referred to it, including the State Faculty Support Grants (SFSG).~~
- ~~(2) Receive and evaluate requests for State Faculty Support Grants and make recommendations for funding, when appropriate, to the Dean for Research.~~
- ~~(3) Make recommendations concerning the funding of other internal grants when appropriate.~~
- ~~(4) Evaluate requests for special leaves for research or creative activity and, when appropriate, rank order them for consideration and transmit this ranking through the Academic Senate Chair to the President.~~
- (1) The Grants Review Committee will develop policies and procedures for the review of grant proposals referred to it, including but not limited to those funded through the Chancellor's Research, Scholarship, and Creative Activity allocations.
- (2) The Grants Review Committee will make recommendations to the Dean of Research concerning the funding of other internal grants subject to review by the source of funding.
- (3) The Grants Review Committee will develop policies and procedures for the selection of Cal Poly State University student delegates to the system-wide CSU Student Research Competition.
- (4) The Grants Review Committee will evaluate both the oral and written presentations of students and select the delegates for the system-wide CSU Student Research Competition.

Adopted:

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

AS-__-15

**RESOLUTION ON APPROVING ASSESSMENT PROCESS FOR COURSES
MEETING SUSTAINABILITY LEARNING OBJECTIVES**

- 1 WHEREAS, Resolution AS-787-14 "Resolution on Sustainability", directs the Academic Senate
2 Sustainability Committee to develop a list of classes based on a revised Senate accepted
3 assessment process that meet the Sustainability Learning Objectives; therefore be it
4
5 RESOLVED: That the Academic Senate approve the attached document "Draft Process to Vet
6 Sustainability Courses for SUSCAT" as a Senate accepted assessment process.

Proposed by: Sustainability Committee
Date: January 12, 2015

Draft Process to Vet Sustainability Courses for Suscat

AS-787-14 resolved “That the Academic Senate Sustainability Committee be directed to develop a list of classes based on a revised Senate accepted assessment process that meet the Sustainability Learning Objectives.” In responding to this resolution, the Academic Senate Sustainability Committee (ASSC) made progress during Fall quarter 2014 by following a simplified Engineering Design Process Flow. Stated in a somewhat simplified manner, the Engineering Design Process uses the following steps:

1. Identify the process stakeholders
2. Define the stakeholders' needs
3. Translate the stakeholders' needs into requirements and specifications
4. Design a process to meet the requirements and specifications
5. Implement and test the Policy.

Figure 1 shows the intended process development and application timeline.

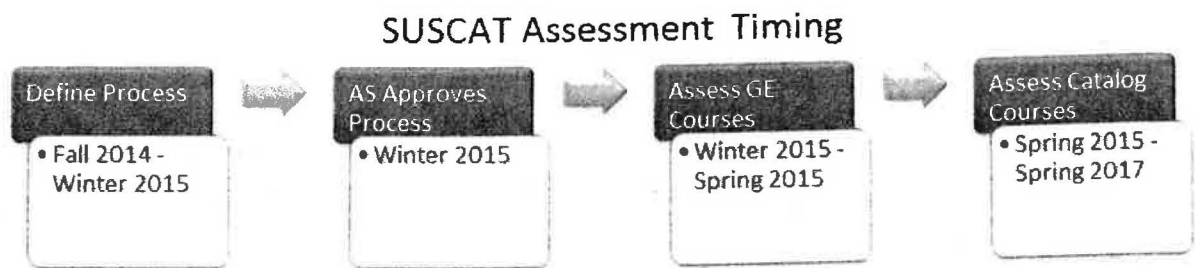


Figure 1 SUSCAT Assessment Timeline

During Fall quarter 2014 and January 2015, the process moved through steps 1, 2, 3, and 4, informed by feedback received from key stakeholders. This document contains the results of steps 1–4.

1. Identify the process stakeholders

The process should meet the needs of several stakeholders:

1. Faculty and department heads who teach sustainability courses and want them listed on SUSCAT
2. Students who want to take sustainability courses
3. Faculty and staff who implement the policy by performing the review
4. Faculty and staff who maintain SUSCAT
5. The Academic Senate, Academic Senate Curriculum Committee, and the GE Governance Board
6. Academic Advisors
7. CSU Administrators
8. Faculty and department heads who would like to teach sustainability but don't know how.

2. Define the stakeholders' needs

Table I identifies stakeholders associated with the assessment process and their needs. The third column indicates a check, if the currently defined process meets those stakeholder needs. The current process does meet almost all needs listed for the stakeholders. Because of strong objections expressed to flagging sustainability courses either in the catalog or on PASS, the currently defined process doesn't meet those needs. Rather, it describes how to identify courses to list on the SUSCAT website, suscat.calpoly.edu.

Table I Stakeholder Needs Assessment

Stakeholder	Needs	Met?
Faculty and department heads who teach sustainability courses and want them listed on SUSCAT	<ol style="list-style-type: none"> 1. Simple and convenient process. 2. Reproducible process 3. Can appeal decision. 	✓
Students who want to take sustainability courses	<ol style="list-style-type: none"> 1. Reproducible process. 2. Process should identify all relevant sustainability courses. 3. Should see results in catalog and PASS. 	✓ ✓ X
Faculty and staff who implement the policy by performing the review	<ol style="list-style-type: none"> 1. Simple and convenient process. 2. Reproducible process. 	✓
Faculty and staff who maintain SUSCAT	<ol style="list-style-type: none"> 1. Easy to update. 2. Automatically delist defunct courses. 3. Automatically become aware of new course. 	✓
The Academic Senate, Academic Senate Curriculum Committee, and the GE Governance Board	<ol style="list-style-type: none"> 1. Reproducible process. 2. Serves students and faculty. 3. Serves curricular needs. 4. Serves course and catalog administrative needs. 	✓
Academic Advisors	<ol style="list-style-type: none"> 1. Reproducible process. 2. Process should identify all relevant sustainability courses. 3. Should see results in catalog and PASS. 	✓ ✓ X
CSU Administrators	<ol style="list-style-type: none"> 1. Report data on percentage of classes & number of classes meeting each Sustainability Learning Objective [SLO] 	X
Faculty and department heads who would like to teach sustainability courses but don't know how.	<ol style="list-style-type: none"> 1. Clear Instructions 	✓

3. Translate the stakeholders' needs into requirements and specifications

In order to develop process requirements and specifications from the stakeholder needs, the ASSC relied heavily on lessons learned from its review of GE courses in 2012. For the 2012 review, the ASSC developed a rubric to use to evaluate whether courses achieve at least two of the Sustainability Learning Objectives [SLOs]. Each college representative to the ASSC applied the rubric to the GE courses from their college, obtaining input from the ASSC, as necessary. During the 2012 GE course pilot assessment, the ASSC learned the following lessons:

1. Based on the title and catalog description, many or most courses clearly DO NOT achieve at least two SLOs.
2. Based on the title, catalog description, and course proposal, some courses clearly DO achieve at least two SLOs.
3. Based on the title, catalog description, and course proposal, some courses MAY or MAY NOT achieve at least two SLOs. This is a small group.
4. A relatively small fraction of GE courses achieve at least two SLOs.
5. Only list courses in which students achieve at least two SLOs regardless of the instructor.
6. A two-part rubric covered the above cases. One part used title and catalog description only. The other part relied on a course proposal form, course modification form, ABET or other detailed Syllabus, and/or Expanded Course Outline.

After significant deliberations prior to the 2012 GE course pilot assessment, during a 2012 inter-rater norming exercise, after the 2012 course pilot assessment, during a Fall 2014 inter-rater norming exercise, and during its Fall 2014 and Winter 2015 meetings, the ASSC arrived at the SUSCAT Evaluation Rubric shown in Figure 2. It represents version 10, and it contains elements gleaned from multiple sources. Most notably, two sources informed the rubric creation and evolution:

1. The 2011 University Expository Writing Rubric,
Available: <http://ulo.calpoly.edu/content/writing-proficiency-assessment>, and
http://content-calpoly-edu.s3.amazonaws.com/ulo/1/documents/university_writing_rubric.pdf
2. Association of American Colleges & Universities, *VALUE (Valid Assessment of Learning in Undergraduate Education) Rubric Development Project*, 2007-2009,
Available: <http://www.aacu.org/value/rubrics>

During the 2012 GE course pilot assessment, the ASSC agreed that a course meeting two or more SLOs met the threshold for listing. Further deliberations during Fall 2014 reveal that the ASSC still agrees with this threshold, but with an important caveat. Just having students learn about two or more SLOs in a minimal fashion does not suffice. Meaningful sustainability learning should take place, and the revised rubric seeks to measure meaningful learning in two ways:

1. Students should achieve multiple SLOs during the course, and
2. Students achieve the SLOs during a meaningful fraction of the course.

Academic Senate Sustainability Committee SUSCAT Evaluation Rubric

Course Prefix & Number Replace this cell with course Prefix & Number, e.g. GEOG 301

Course Title Replace this cell with course Title, e.g. Geography of Resource Utilization

Course Description Replace this cell with course catalog description, e.g. A multicultural, world view of the interconnections of the following resource systems: food, energy, water, and non-fuel minerals. A pervading theme is the sustainability of these systems. 4 lectures. Prerequisite: Completion of GE Areas A, D3. Recommended: Junior standing. Fulfills GE D5 except for Social Sciences majors.

GE Area, if any [Redacted]

Evaluator name: Joe Blow

Evaluator User Name: jblow@calpoly.edu

Initial Assessment Based on Course Title & Description		Points Possible	Points Actual		
Yes, the course very likely achieves at least two of the four SLOs.		2	Enter score 0-2 in cell F10		
Maybe, the course might achieve one or more SLOs.		1			
No, the course doesn't seem to address the SLOs.		0			
Cal Poly defines sustainability as <i>the ability of natural and social systems to survive and thrive together to meet current and future needs.</i>					
Assessment Based on Course Proposal or Syllabus	Minimal Evidence Score = 0	Threshold Evidence Score = 1	Strong Evidence Score = 2 *	Superior Evidence Score = 3 **	Score
SLO1: Students define and apply sustainability principles within their academic programs	Syllabus does n't mention SLO	Syllabus mentions SLO	Syllabus shows SLO student outcomes	Syllabus has SLO as a major course focus	Enter score 0-3 in cell F17
SLO2: Students explain how natural, economic, and social systems interact to foster or prevent sustainability	Syllabus does n't mention SLO	Syllabus mentions SLO	Syllabus shows SLO student outcomes	Syllabus has SLO as a major course focus	Enter score 0-3 in cell F18
SLO3: Students analyze and explain local, national, and global sustainability using a multidisciplinary approach	Syllabus does n't mention SLO	Syllabus mentions SLO	Syllabus shows SLO student outcomes	Syllabus has SLO as a major course focus	Enter score 0-3 in cell F19
SLO4: Students consider sustainability principles while developing personal and professional values	Syllabus does n't mention SLO	Syllabus mentions SLO	Syllabus shows SLO student outcomes	Syllabus has SLO as a major course focus	Enter score 0-3 in cell F20
Total Score (SLO1 - SLO4)					0
20% or more of the course covers the SLOs.				Yes/No	Enter yes or no in cell F24
Sustainability Course (Score >=6 AND 20% or more sustainability)					No
If course doesn't address the SLOs, could it?				Yes/No	
Suggestion(s) how course might address one or more of the SLOs:					
[Redacted]					
Other Comments:					
[Redacted]					

* A score of 2 requires the syllabus to show SLO student outcomes AND mention the SLO.

** A score of 3 requires the syllabus to have the SLO as a major course focus AND show the SLO student outcomes AND mention the SLO.

Figure 2 SUSCAT Evaluation Rubric

Since many courses only require reviewing the course title and catalog description, the rubric contains a section titled *Initial Assessment Based on Course Title & Description*. Since a small fraction of courses requires more detailed review, the rubric contains a section titled *Assessment Based on Course Proposal or Syllabus*. This section relies on review of at least a course proposal form, course modification form, ABET or other detailed Syllabus, and/or Expanded Course Outline. The SUSCAT Evaluation Rubric uses the term Syllabus generally to refer to the various course descriptions listed in the previous sentence. The rubric does not intend to rely on instructor specific documentation. A possibility exists that such information may prove less easy to access for some courses than for others, so the process leaves reviewers an option to request more information, if desired.

The detailed review examines to what extent the course addresses each SLO based primarily on the evidence provided from the course learning objectives. Figure 3 shows the SLO evaluation scale portion of the rubric. Based how the Syllabus mentions a SLO, shows student outcomes for a SLO, or has a SLO as a major course focus, the scale rates the evidence “Minimal,” “Threshold,” “Strong,” or “Superior” and assigns a corresponding score from 0 to 3 for each SLO. With four SLOs each rated from 0 to 3, the course would receive a score from 0 to 12. The ASSC feels that a total score of 6 represents the minimum score necessary to demonstrate a course achieves multiple SLOs. A course could reach a total score of 6 via several combinations of scores for individual SLOs. For example, two SLOs with superior evidence plus two SLOs showing minimal evidence would give a total score of $2*3 + 2*0 = 6$. Or, three SLOs with strong evidence plus one SLO showing minimal evidence would give a total score of $3*2 + 1*0 = 6$. Similarly, $3 + 2 + 1 + 0$ or $2 + 2 + 1 + 1$ reach the required score of 6.

Additionally, to measure whether SLOs reach a meaningful fraction of the course, the rubric asks whether at least 20% of the course covers the SLOs. The 20% threshold arose from multiple discussions at ASSC meetings before, during, and after the Fall 2014 inter-rater norming exercise. The ASSC reached a consensus that having at least two weeks of a course addressing the SLOs meets its threshold. Combining these goals of meeting multiple SLOs over at least two weeks in the course leads to the rubric’s threshold for listing a course on SUSCAT: The total score equals or exceeds 6, and at least 20% of the course covers the SLOs.

Minimal Evidence Score = 0	Threshold Evidence Score = 1	Strong Evidence Score = 2 *	Superior Evidence Score = 3 **
Syllabus doesn't mention SLO	Syllabus mentions SLO	Syllabus shows SLO student outcomes	Syllabus has SLO as a major course focus

Figure 3 SLO Evaluation Scale from SUSCAT Evaluation Rubric

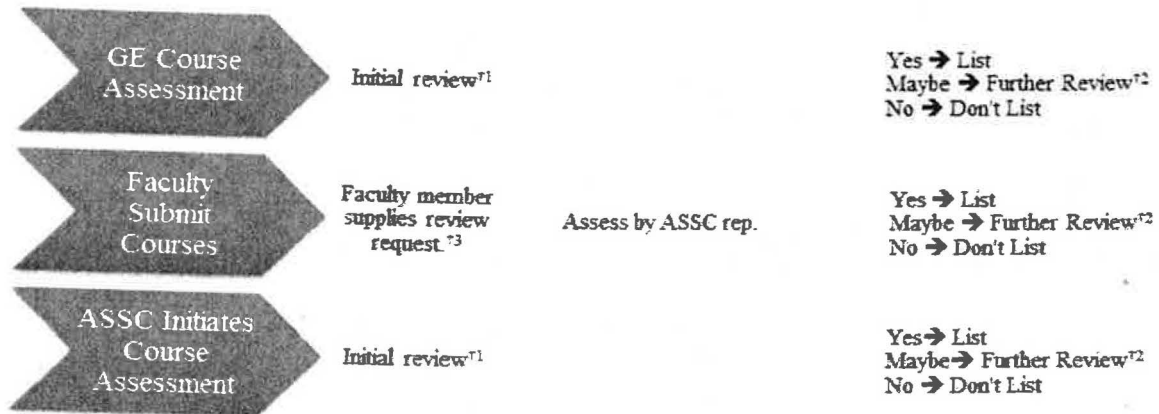
Table II contains and justifies the process specifications as derived from the stakeholder needs and the marketing requirements. In summary, the process expects the ASSC to consider all courses in the catalog for listing on the SUSCAT website, starting with the GE courses and giving expedited reviews as requested for specific courses. The process relies on a variety of course documentation and iterative reviews as necessary to assure quality control and inter-rater reliability. The currently proposed process meets all but two of the marketing requirements.

TABLE II SUSCAT REVIEW POLICY REQUIREMENTS AND SPECIFICATIONS

Marketing Requirements	Specifications	Justification
2	SUSCAT contains any course achieving at least two SLOs (Rubric score ≥ 6 AND at least 20% of course covers SLOs).	Policy approved by ASSC in 2012 and revised in 2014.
1, 2, 4	The ASSC reviews all GE courses.	Per 2014-2015 ASSC charges.
2, 4, 8, 9, 10, 11	The ASSC must review additional courses.	Policy approved by ASSC in 2014.
1, 2, 3, 4, 6	Faculty may submit SUSCAT review requests for specific courses to the ASSC.	To prevent overlooking a course belonging in SUSCAT.
1, 2, 3, 4, 9	A process exists to handle faculty appeals of initial SUSCAT review decisions.	Provides checks and balances. Encourages inter-rater reliability.
1, 2, 3, 4, 9, 10	The review process may require additional information such as course proposal forms, course modification form, ABET or other detailed Syllabus, and/or Expanded Course Outline.	Title and course description alone may not suffice to identify whether a course meets any of the SLOs.
1, 2, 3, 4, 9, 10, 11	Applicants may justify how a course meets SUSCAT approval criteria.	In case course documentation supplied for SUSCAT review didn't suffice for an accurate review, applicants may submit additional documentation.
4, 8, 9, 10, 11	The ASSC reviews all new courses approved by the ASSC.	To maintain currency.
9, 10, 11	The SUSCAT list appears online.	To make list easily available to all stakeholders.
4, 9, 10	The ASSC communicates decisions to faculty and department heads.	Requested by several stakeholders.
Marketing Requirements <ol style="list-style-type: none"> Simple and convenient process. Reproducible process Can appeal decision. Process should identify all relevant sustainability courses. Should see results in catalog and PASS. Not specified yet. Easy to update. Automatically delist defunct courses. Automatically become aware of new course. Serves students and faculty. Serves curricular needs. Serves course and catalog administrative needs. Report data on percentage of classes & number of classes meeting each SLO Not specified yet. 		

4. Design a process to meet the requirements and specifications

SUSCAT Course Assessment Process Draft V4



- *1 The ASSC representative reviews course number, title, and catalog descriptions in their college to determine a list of maybe and no courses.
- *2 Further review in case of "Maybe" means the ASSC has three other ASSC faculty members evaluate the application in detail. Two or more yeses → yes. One yes and two maybes → yes. Other combinations → no. The ASSC may request more info. if desired.
- *3 The review request contains the course number, title, catalog description and an explanation how the course meets at least two SLOs, accompanied by sufficient documentation (course proposal form, course modification form, ABET or other detailed Syllabus, and/or Expanded Course Outline) to support the case.

Figure 4 SUSCAT Course Assessment Process Draft V4

SUSCAT Course Appeals Process

A faculty member may appeal a yes or no assessment decision to the ASSC by sending an email with their reasoning to the ASSC Chair. The Chair assigns five ASSC faculty members to assess the course in detail. Three or more yeses → yes.

Figure 5 SUSCAT Course Appeals Process

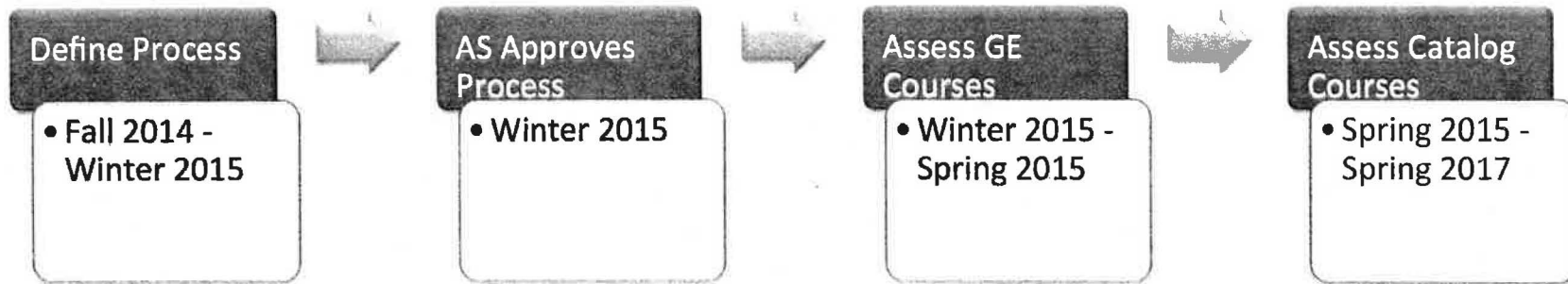
Listing SUSCAT GE Courses on GE Website – Details

1. Obtain permission from GE Chair, Brenda Helmbrecht, to tag courses on GE web site
2. Communicate with Department Chair/Faculty about sustainability courses to list on GE web site (Draft letter available)
3. Advise Curriculum Committee
4. Advise Academic Senate/Executive Committee
5. Communicate to campus/students

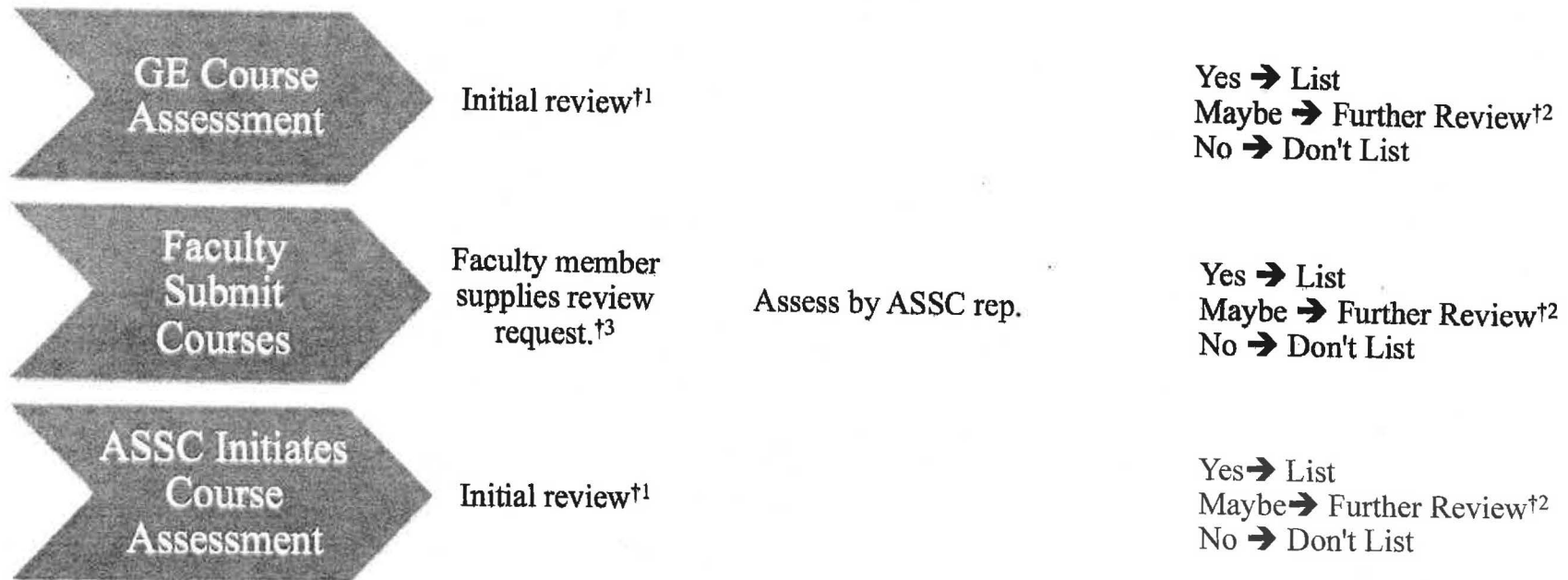
Listing SUSCAT Courses on SUSCAT – Details

1. ASSC updates the SUSCAT course list quarterly.
2. ASSC sends updated list to Miles Clark quarterly.
3. Miles Clark updates <http://suscat.calpoly.edu/>

SUSCAT Assessment Timing



SUSCAT Course Assessment Process Draft V4



†1 The ASSC representative reviews course number, title, and catalog descriptions in their college to determine a list of maybe and no courses.

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Adopted: June 3 2014

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

AS-787-14

RESOLUTION ON SUSTAINABILITY

1 WHEREAS, In May 2003, the Academic Senate endorsed the Talloires Declaration; and
2

3 WHEREAS, In August 2003, President Warren Baker signed the Talloires Declaration; and
4

5 WHEREAS, Provisions 3 and 4 of the Talloires Declaration focus on educating for
6 environmentally responsible citizenship and on fostering environmental literacy; and
7

8 WHEREAS, The University has as one of its University Learning Objectives that graduates of Cal
9 Poly should "Make reasoned decisions based on an understanding of ethics, a respect for
10 diversity, and an awareness of issues related to sustainability"; and
11

12 WHEREAS, The University defined the term sustainability, as part of its Sustainability Learning
13 Objectives, as being "the ability of the natural and social systems to survive and thrive
14 together to meet current and future needs"; and
15

16 WHEREAS, The University's Sustainability Learning Objectives state that students should be able to
17 "Define and apply sustainability principles within their academic programs"; and
18

19 WHEREAS, Some Cal Poly students graduate without satisfying the sustainability element of the
20 University Learning Objectives nor the Sustainability Learning Objectives; and
21

22 WHEREAS, Cal Poly has a responsibility to ensure that its graduates meet the sustainability
23 element of the University Learning Objectives and the Sustainability Learning
24 Objectives; and
25

26 WHEREAS, Some Cal Poly students will be employed in jobs requiring an understanding of
27 sustainability; and
28

29 WHEREAS, There is a need to refine and develop more classes to help students meet the
30 sustainability element of the University Learning Objectives and to meet the
31 Sustainability Learning Objectives; and
32

33 WHEREAS, There is not currently an established system that designates and communicates
34 whether a class meets the Sustainability Learning Objectives; and

35 WHEREAS, A list of University sustainability classes would be helpful to students and faculty; and
36

37 WHEREAS, A list of University sustainability classes would be helpful for programs wanting to
38 incorporate sustainability into their curricula; and
39

40 WHEREAS, Other CSU campuses currently have lists of sustainability classes and catalog tags for
41 these classes; and
42

43 WHEREAS, The Academic Senate Sustainability Committee has developed and tested a procedure to
44 determine whether a class meets the Sustainability Learning Objectives; therefore be it
45

46 RESOLVED: That the Academic Senate Sustainability Committee be directed to develop a list of
47 classes based on a revised Senate accepted assessment process that meet the
48 Sustainability Learning Objectives and, by extension, the relevant portion of the
49 University Learning Objectives; and be it further
50

51 RESOLVED: That faculty should be encouraged to develop new sustainability classes and to modify
52 existing courses by including sustainability, especially interdisciplinary courses as well
53 as courses satisfying General Education requirements; and be it further
54

55 RESOLVED: That the Academic Senate Sustainability Committee in conjunction with the Center for
56 Teaching, Learning and Technology shall provide support for faculty seeking to teach
57 classes involving sustainability; and be it further
58

59 RESOLVED: That the Academic Senate Sustainability Committee be directed to work with student
60 and campus organizations, as well as Facilities, to identify opportunities to promote
61 alternative approaches to sustainability education on campus that would further
62 facilitate students explicitly meeting the learning objectives addressing sustainability.

Proposed by: Sustainability Committee and Josh
Machamer, Chair of the GE
Governance Board

Date: April 15, 2014

Revised: May 28, 2014

Revised: June 3, 2014

Assessment of Courses as Potentially Satisfying the Sustainability Learning Objectives: The Procedure Used to Assess GE Courses (2012)

The foundation of the sustainability assessment is the Cal Poly Sustainability Learning Objectives (SLOs).¹ Cal Poly defines sustainability as the ability of the natural and social systems to survive and thrive together to meet current and future needs. In order to consider sustainability when making reasoned decisions, all graduating students should be able to:

1. Define and apply sustainability principles within their academic programs
2. Explain how natural, economic, and social systems interact to foster or prevent sustainability
3. Analyze and explain local, national, and global sustainability using a multidisciplinary approach
4. Consider sustainability principles while developing personal and professional values

To assess the courses, two members of the Academic Senate Sustainability Committee (ASSC) read through the course learning objectives of a particular GE course found in the GE course proposal form. Those readers determined to what degree those learning objectives addressed each of the four sustainability learning objectives (SLOs). This was done using the following scoring

The scoring range was as follows:

- **3:** Course directly addresses the given SLO with one or more course learning objective or course topic;
- **2:** Course probably addresses the given SLO;
- **1:** Course might indirectly address the given SLO; and,
- **0:** The course doesn't seem to address the given SLO.

After scoring the relevance of each SLO, a summary score was calculated based on the scores for each of the SLOs. Specifically, the score is calculated as follows:

- Summary score of 2 means that the course very likely achieves at least two of the four SLOs;²
- Summary score of 1 means that the course might achieve one or more SLOs;³ and,
- Summary score of 0 means that the course doesn't seem to address the SLOs.⁴

¹ Academic Senate Resolution 688-09 approved by President Baker June 22, 2009; www.academicprograms.calpoly.edu/content/academicpolicies/sustainability_lo

² A final score of 2 is given if in the SLO scores there are at least two 3's or one 3 and two or three 2's (e.g. SLO1 = 3, SLO2 = 3, SLO3 = 0, SLO4 = 0 or SLO1 = 3, SLO2 = 2, SLO3 = 2, SLO4 = 1).

³ A final score of 1 is given if the final evaluation does not result in a 2 or 0.

⁴ A final score of 0 is given if there are no SLO scores of 2 or 3.

Res_SustainabilityAssessmentProcedure_GE_2012.docx

Academic Senate Sustainability Committee SLOs Evaluation Rubric

Course Prefix & Number

Replace this cell with course Prefix & Number, e.g. GEOG 301

Course Title

Replace this cell with course Title, e.g. Geography of Resource Utilization

Course Description

Replace this cell with course catalog description, e.g. "A multidisciplinary world view of the interconnections of the following resource systems: food, energy, water and non-fuel minerals. A pervading theme is the sustainability of these systems, and features. Prerequisite: Completion of GE Area A, D+ Recommended: Junior standing. Fulfills GE D5 except for Social Sciences majors.

GE Area, if any

Evaluator name

Evaluator User Name

Evaluator

evaluator@calpoly.edu

Cal Poly defines sustainability as

the ability of the natural and social systems to survive and thrive together to meet current and future needs.

Initial Assessment Based on Course Title/Description

Points Possible

Points Actual

Yes, the course very likely achieves at least two of the four SLOs

2

Maybe, the course might achieve one or more SLOs

1

No, the course doesn't seem to address the SLOs

0

Points

	3	2	1	0	Points
Assessment Based on Course Proposal or Syllabus	Course directly addresses each SLO and includes learning objectives or outcomes	Course partially addresses each SLO	Course might address one or two SLOs	Course does not address any SLOs	
SLO1: Define and apply sustainability principles within their academic programs					
SLO2: Explain how natural, economic, and social systems interact to foster or prevent sustainability					
SLO3: Analyze and explain local, national, and global sustainability using a multidisciplinary approach					
SLO4: Consider sustainability principles while developing personal and professional values					
Estimated fraction of course devoted to SLOs	60-80%	30-50%	20-40%	10%	

Summary Assessment Based on Course Proposal or Syllabus

Points Possible

Points Actual

Yes, the course very likely achieves at least two of the four SLOs

2

Maybe, the course might achieve one or more SLOs

1

No, the course doesn't seem to address the SLOs

0

Does course directly address the SLOs "and/or"

Yes/No

Suggestion(s) how course might address one or more of the SLOs:

Other Comments:

For office use only	
First course	
Second course	
Average	

Code

State of California
Memorandum

CAL POLY

SAN LUIS OBISPO

To: Gary Laver
Chair, Academic Senate

Date: August 18, 2014

From: Jeffrey D. Armstrong
President



Copies: K.ENZ Finken
M. Pedersen

Subject: Response to Academic Senate Resolution AS-787-14
Resolution on Sustainability

This memo formally acknowledges receipt of the above-entitled Academic Senate resolution.

Adopted:

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

AS-___-15

**RESOLUTION ON PROPOSED NEW DEGREE PROGRAM:
BACHELOR OF SCIENCE IN MARINE SCIENCES**

- 1 RESOLVED: That the proposed new degree program, Bachelor of Science in Marine Sciences,
2 be approved.

Proposed by: The Department of Biological Sciences
Date: February 20, 2015

Cal Poly, San Luis Obispo

Summary of Statement of Proposed New Degree Program

1. Title of proposed program

Bachelor of Science degree in Marine Sciences

2. Reason for proposing the program

Description and Rationale for offering the Marine Sciences B.S. at Cal Poly

The Marine Sciences B.S. degree program at California Polytechnic State University, San Luis Obispo (Cal Poly) is designed to provide students with a broad foundation in multiple areas of marine sciences, including ample opportunities for active application of knowledge in class and research projects in the lab and field as well as requiring community-oriented outreach activities to promote ocean literacy. We have also included flexibility in the degree to allow students to focus on one of the sub-disciplines including marine biology, chemistry, oceanography, or the more technical and instrumentation focused areas in engineering.

Cal Poly is uniquely poised to create a new B.S. degree in Marine Sciences to provide integrative practical, project based technical undergraduate training that is required to meet the demands of managing and understanding our ocean resources. We currently have a concentration in Marine Biology within the Department of Biological Sciences. We feel it is important to replace the concentration with a new more interdisciplinary degree that better represents the field of Marine Sciences. The degree will attract more students and offer more opportunities for hands-on training and a more diverse set of career opportunities for our students. The new degree will build on our experience with the Marine Biology Concentration and the strengths of existing faculty to provide hands on field-based and laboratory training in marine sciences across multiple disciplines (e.g. Biological Sciences, Chemistry, Engineering, Liberal Arts, Mathematics, and Physics).

More specifically, students will learn to integrate concepts in marine science, formulate hypotheses, predications as well as analyze and interpret data and scientific literature. They will also learn to identify and categorize marine organisms and demonstrate proficiency in lab and field techniques relevant to marine sciences. All graduates will also be able to communicate scientific principles and research findings to diverse audiences.

The Program's Strengths

In 2002, Cal Poly established the Center for Coastal Marine Sciences (CCMS), a cooperative group of faculty, labs on campus, and our pier facility in Avila Beach. The mission of CCMS is to foster hands-on learning, discovery and outreach by our students, faculty, and staff in order to promote sustainability, facilitate interdisciplinary studies of coastal marine systems, and address pressing issues facing our ocean health and marine resources. We currently have research and training programs in place that reflect our national, state, and university priorities for ocean protection. In addition, the federal government has recognized our efforts and the strength of our

Center by placing a new CA Sea Grant Extension Specialist at Cal Poly in Fall 2014.

Cal Poly has an ideal geographic location for training future marine scientists. Importantly, Cal Poly is situated near diverse ecosystems that we incorporate into our teaching and research programs, including the CCMS Pier marine laboratory facility. The CCMS pier facility is a 1 km long pier off Avila Beach, CA, approximately 12 miles from campus (www.marine.calpoly.edu). The CCMS pier provides 2,000 sq. ft. laboratory space, with an overall usable space offshore of 40,000+ sq. ft. for field-based experiments, field-testing of sensors and platforms, educational activities, and small vessels launch for near shore research, teaching and collections. The facility has internet connectivity and a state-of-the-art classroom space. The CCMS also owns and operates five small vessels used for near shore research and teaching. This facility has a high quality flowing seawater system that allows us to maintain marine life in natural seawater and conduct large-scale, long-term experiments and course projects.

This new Marine Sciences B.S. degree will emphasize an interdisciplinary approach, attracting students from many areas of science. Currently, all degree programs at Cal Poly are classified as "Impacted" (CSU Impacted Programs report, 2012-2013). This degree option may open opportunities and draw from those impacted programs.

Note: A full version of the proposal is available from N. Adams upon request.

3. Expected student learning outcomes and methods for assessing outcomes:

a. Learning Outcomes

Program learning outcomes (PLOs)

Graduates of the Marine Sciences B.S. program will be able to:

1. Integrate and synthesize information from the various marine disciplines
2. Recognize and value the diversity of marine life and ecosystems
3. Apply the scientific method, by formulating hypotheses, making predictions, and assesses, analyzing, synthesizing, and interpreting data
4. Communicate marine scientific principles and research findings effectively to diverse audiences verbally and in writing
5. Demonstrate proficiency in lab and field techniques relevant to marine sciences
6. Locate and utilize bibliographic resources and demonstrate the ability to evaluate scientific literature.

Student learning outcomes (SLOs)

Students who successfully complete the Marine Sciences B.S. program will be able to:

Identify, explain, critically evaluate and solve problems using principles, methodology, theories and literature from multiple disciplines in marine sciences

1. Classify, organize, evaluate and compare the structures and function of major life forms in the ocean
2. Describe how these life forms interact with one another and the ocean ecosystem
3. Design, conduct, evaluate and compare experimental approaches to scientific observation, hypothesis testing, data acquisition and statistical analysis in marine systems
4. Demonstrate and apply excellent written, verbal, and listening communication skills

5. Demonstrate the ability to work in a professional communications setting through experiential learning (i.e. internships, work experience student organizations, outreach events)
6. Use basic field and lab equipment to gather data on biological, chemical and physical characteristics of the ocean
7. Procure, explain and critically evaluate primary literature and key theories in the marine sciences

b. Comprehensive Assessment Plan

Assessment Methods for PLOs and SLOs

A Marine Sciences Degree assessment committee will be formed with rotating memberships comprised of faculty and staff. This committee will analyze data from various artifacts including embedded exam questions, lab reports, student oral and written reports, presentations, and senior-exit and alumni surveys. See Appendix 1, Table 1.

The Assessment Committee will summarize its assessment activities at the end of each academic year and will then report the results to the Department of Biological Sciences. More specifically, one or two PLOs will be assessed each year on a rotating schedule for a complete three-year cycle. For example, PLOs one and two will be assessed the first year, PLOs three and four will be assessed the second year etc.

The Committee will make recommendations on how the major can be improved based on assessment results. The Department will decide upon and perform additional curricular follow-ups to all assessment activities, which may involve consultations with external bodies (alumni, industry, etc.).

Direct Assessment

The types of artifacts that will be used to collect direct assessment data include:

- Embedded questions in exams linked to specific SLOS/PLOs
- Projects, term papers, oral presentations, lab reports, field exercises; using rubrics developed around certain criteria for specific learning outcome to be assessed. Each course will have artifacts linked to SLOs and PLOs.
- **Capstone Experience:** Senior project proposal or research projects. Progress through the Marine Sciences degree provides a cumulative experience, initiating with foundational coursework and culminating with a research experience. Students can experience this milestone through upper division laboratory or field courses in combination with a Senior Project proposal-writing course (BIO 461) or through direct faculty-led hands on research projects (BIO 462). In either case written proposals or reports can be evaluated using an appropriate rubric to assess many of the PLOs (see appendix).

Indirect Assessment

The following methods will be used to collect data that reflects indirect assessment:

- **Surveys/Interviews:** The Marine Sciences program will survey graduating seniors and alumni to gather data and feedback for assessment of program objectives.
- **Graduate status report:** External indicators can serve as excellent feedback that the Marine Sciences degree is meeting its program goals. The Graduate Status reports will help determine the success of the graduates at securing positions in industry, governmental agencies and associated careers in marine sciences or enrolling in graduate programs.

4. Anticipated student demand and enrollment:

	At initiation	After 3 years	After 5 years
Number of Majors	24	100	≥ 150
Number of Graduates (total)	--	12	≥ 50
Basis for projection	Numbers will be from recruitment and some internal transfers.	Anticipated number of students the program will be able to support.	Anticipated number of students the program will be able to support.

Indicate briefly what these projections are based upon:

This new Marine Sciences B.S. degree will emphasize an interdisciplinary approach, attracting students from many areas of science. Currently, all degree programs at Cal Poly are classified as “Impacted” (CSU Impacted Programs report, 2012-2013). This degree option may open opportunities and draw from those impacted programs. For example CSU Monterey Bay, which is the only other campus in the CSU system to offer a specifically “marine science” B.S. degree, had a ~11% acceptance rate this fall and has experienced a greater than 200% growth rate since piloting their program in Fall 2011 (e.g. enrollment has been as follows: Fall 2011= 1 student, Spring 2012=78 students and Fall 2012= 219 students) (CSU Monterey Bay 2011 and 2012 Institutional Planning enrollment reports).

Data from a Nov 2014 analysis by Cal Poly’s Office of Enrollment Planning showed that students nationwide graduating between 2015-2018, meeting the Cal Poly average College Board exams of 1200-1600, with a GPA of C or higher and who have an interest in a major in Marine Sciences will provide Cal Poly with a potential pool of at least 1,886 applicants.

A Fall 2014 survey of our current PHYS, CHEM, BIO students reveals that at least 38 of 92 existing students who completed the survey would like to transfer into the Marine Sciences B.S. program when it starts in 2016.

5. If additional resources (faculty, student allocations, support staff, facilities, equipment, etc.) will be required, please identify the resources needed and from where they will come:

There is no anticipated need for additional resources because this program will incorporate expertise from across campus, welcoming faculty from several departments to develop curricula, team-teach courses, and co-advise students. Over 85% of the curriculum is being delivered through existing courses. Faculty members already teach most of the courses included in the

proposed curriculum so many resources are already in place. The remaining six courses have recently been approved for the 2015-2017 catalog and will be taught by existing faculty.

This BS program will increase the use of existing resources such as our CCMS Pier facility, which has a large potential for growth. In addition, having a B.S. Marine Science program will enhance Cal Poly's ability to attract top students and ultimately generate funds via substantial, multi-year, and perhaps multi-institution grants. For example, this program will attract students and faculty who will create a successful NSF, REU internship program that would help support additional student involvement in faculty-led research programs.

The Marine Sciences B.S. curriculum would benefit by but not absolutely require hiring new faculty with expertise in biological oceanography, marine mammal biology, and marine geology. CSM dean, Dr. Phil Bailey, supports adding new faculty positions if there is an increase in the number of new students to CSM and Cal Poly.

6. If the program is occupational or professional, briefly summarize evidence of need for graduates with this specific education background:

Graduates with a B.S. degree in Marine Sciences from Cal Poly will be prepared to enter graduate programs (MS, PhD) and careers in academic research, veterinary school, positions in government, public or private agencies, and more technical careers in a large diversity of fields.

According to the US Bureau of Labor Statistics' Occupational Outlook Handbook (2013-14 Edition) the general area of environmental sciences is expected to increase 19 percent (higher than average) during the next decade (from 2012 to 2022). Because this is a multidisciplinary degree and there are many disciplines to choose from within the field, it can be difficult to compare occupational statistics for specific training programs. Our projections are based on an overarching career such as environmental scientist because heightened public interest in the hazards facing the environment, as well as the increasing demands placed on the environment by population growth, are expected to spur demand for environmental and marine scientists and specialists. In addition, this degree program will train future biochemists and bio physicists, conservation biology, zoology and wildlife biology and geosciences. See table below to view projected growth of each area.

The California Labor Employment Development Department clusters Marine Sciences into careers in Environmental Sciences or Zoology and Wildlife Biology. The California market for environmental scientists is expected to grow from 201 to 2022 from 14,900 to 19,300 (growth of 4,400 employees, 29.5%).

7. If the new program is currently a concentration or specialization, include a brief rationale for conversion:

Our current Marine Biology and Conservation Concentration currently has a total of ~ 48 students and 12 students graduate per year. We consistently receive feedback from potential undergraduates interested in marine science that they did not know that Cal Poly has a marine focus because they can't find the concentration in degree searches. In addition, local counselors are equally unaware that we have a marine emphasis and have advised students to apply elsewhere. Creating a full degree program will help alleviate this confusion. We anticipate 24-30 majors in the first year will come from this concentration in Biological Sciences or other

CSM BS majors (some students will remain and graduate in the existing concentration). After three years, we anticipate we will grow to 84-100 students, attracting students who would already be interested in CSM degrees. After five years, we anticipate we will have 100-150 total majors. We believe the program will grow and after the third year we will be drawing additional students beyond the average CSM student body. Therefore, we anticipate CSM will grow slightly over time due to this program.

8. If the new program is not commonly offered as a bachelor's or master's degree, provide a brief, compelling rationale explaining how the proposed subject area constitutes a coherent, integrated degree major, which has potential value for students:

There is only one other Marine Sciences B.S. program in the CSU system. There are other Marine Biology programs, but the Marine Sciences degree offers more interdisciplinary training.

In 2010, President Obama established a National Policy for the Stewardship of the Ocean, Coasts, and Great Lakes and adopted the recommendations of the report by the national Interagency Ocean Policy Task Force for improved stewardship of our oceans. The recommendations included using an interdisciplinary approach to marine resource management to better maintain healthy, resilient and sustainable oceans and coasts. This established the first national policy on ocean stewardship and created the National Ocean Council (NOC). This initiative mandates increased training for our future workforce and better educating the public through formal and informal programs about the ocean, our coasts, and the Great Lakes (Final Recommendations Report, NOC). Our proposed B.S. degree in Marine Sciences at Cal Poly will align with many of the recommendations of the NOC and will prepare our graduates for careers contributing to informing science, management, policy and the public about the best practices for conserving our nation's marine resources.

The marine environment is particularly important to the California economy and its ecology; unprecedented changes to our coastal ecosystems are anticipated over the next 50 years, which has created a critical need for a better understanding of how such changes will affect our environment, human health, coastal communities, and economies. The citizens of California and the nation rely on a multibillion-dollar ocean economy. California's coastal systems require novel multidisciplinary efforts because of the inherent complexities, and responsible and sustainable solutions required for the problems. Implementing emerging innovative solutions requires an educated populace that can appreciate and understand the complex environmental challenges and act to meet them. The current workforce of California is ill prepared to meet these challenges (Science Literacy in California, Ocean Science Literacy Campaign). The California State University (CSU) and Cal Poly can play a key role in providing the necessary transformations in sustainable environmental science needed by the State.

The CSU system is well positioned to take a leadership role in training bachelors and masters levels students in marine science. To address these needs, the CSU Council on Ocean Affairs, Science and Technology (COAST) was established in 2008 to integrate system-wide resources and promote interdisciplinary multi-campus collaborations to advance our knowledge of California's natural coastal and marine resources and the processes that affect them (CSU COAST Strategic Plan 2010). COAST's mission is to provide vision, leadership, and support throughout the CSU system for education, policy and research related to marine, estuarine, and coastal regions, and to promote the public dissemination of knowledge gained to foster stewardship and sustainable use of our coast. In addition to having two faculty campus representatives to COAST, Cal Poly's Director of the Center for Coastal Marine Sciences was

elected to the Executive Committee, the main governing body of the organization that develops and approves policy and activities each year. Most Cal Poly Marine faculty members are active participants in COAST contributing to smaller working groups.

9. Briefly describe how the new program fits with the mission and/or strategic plan for the department, college, and university:

Campus Mission

Cal Poly fosters teaching, scholarship, and service in a learn-by-doing environment where students and faculty are partners in discovery. As a polytechnic university, Cal Poly promotes the application of theory to practice. As a comprehensive institution, Cal Poly provides a balanced education in the arts, sciences, and technology, while encouraging cross-disciplinary and co-curricular experiences. As an academic community, Cal Poly values free inquiry, cultural and intellectual diversity, mutual respect, civic engagement, and social and environmental responsibility.

The Marine Sciences degree will align with this mission by providing high quality interdisciplinary training in hands-on marine sciences, project-based learning and communication of science throughout their coursework. More specifically, the degree includes coursework across all disciplines to provide a balanced education for students. It also includes upper division experiences in conservation and community involvement. We have mapped our program objectives to Cal Poly's Institutional Learning Objectives to further demonstrate how our goals align with our university Mission (See, Appendix, Table 1, Section). In addition, The BS in Marine Sciences degree curriculum will prepare our students to enter and lead the workforce, to matriculate in premier graduate programs and to grapple with and solve the most complicated issues facing society, which is also the mission of our College of Science and Mathematics.

10. Curriculum

B.S. Marine Sciences- 180 units

1. General Education Requirements (56 units)-Minimum of 72 units as indicated by distribution areas (16 of which are in major/support)

Area A Communication (12)

Area B Science and Mathematics (0)-these units are in the degree major/support

Area C Arts and Humanities (20)

Area D/E Society and the Individual (20)

Area F Technology (upper-Division) (4)

2. Support- (Major prerequisites) 49 units- (overlaps with Area B-16 units)

CHEM 127 General Chemistry for Agriculture and Life Science I (4)

CHEM 128 General Chemistry for Agriculture and Life Science II (4)

CHEM 129 General Chemistry for Agriculture and Life Science III (4)

CHEM 216 Organic Chemistry I (5) *

GEOL 102 Introduction to Geology (4)

MATH 141 Calculus I or MATH 161 Calculus Life Sciences I (4)*

MATH 142 Calculus II or MATH 162 Calculus Life Sciences II (4)*

PHYS 121 College Physics I (4) or PHYS 131 (4)*

PHYS 122 College Physics II (4) or PHYS 132 (4)*

PHYS 123 College Physics III (4) or PHYS 133 (4)*

STAT 218 Applied Statistics for Life Sciences (4)

STAT 313 Applied Experimental Design and Regression Models (4)

* Those emphasizing Chemistry, Physics or Engineering should take MATH 141 and 142 instead of MATH 161 and 162. Those emphasizing Physics should take PHYS 141, 132, 133 instead of PHYS 121, 122, and 123.

3. Free Electives (4 units)

4. Major Requirements (71 units)

Marine Sciences Core (36). Take each of these courses:

- BIO 160 Diversity and History of Life (4)
- BIO 161 Introduction to Cell and Molecular Biology (4)
- BIO 162 Introduction to Organismal Form and Function (4)
- BIO 263 Introductory Ecology and Evolution (4)
- BIO 461 Senior Project Proposal Writing (2) or BIO 462-Senior Project Research (2)
- CHEM 302 Marine Chemistry (3)
- MSCI 100 Introduction to Marine Sciences (1)
- MSCI 301 Biological Oceanography (3)
- MSCI 303 Ocean Sampling Techniques (3)
- MSCI 328 Marine Ecology (4)
- PSC 201 Physical Oceanography (4)

Marine Resources Conservation and Policy (4). Take one course from the following list:

- BIO 401 Principles of Conservation Biology (4)
- MSCI 428 Marine Conservation and Policy (4)
- MSCI 438 Aquaculture (4)
- MSCI 439 Fisheries Science and Resource Management (4)

Marine Biodiversity (4). Take one course from the following list:

- MCRO 436 Environmental Microbiology (4)
- MSCI 324 Marine Mammals, Birds, Reptiles (4)
- MSCI 437 Marine Botany (4)
- ZOO 322 Ichthyology (4)
- ZOO 336 Invertebrate Zoology (4)

Communicating Science (1-4). Take one course from the following list:

- COMS 390 Environmental Communication (4)
- COMS 395 Science Communication (4)
- MSCI 401 Marine Sciences Outreach (1-4)
- MSCI 440 Communicating Ocean Science to Informal Audiences (3)
- SCM 302 Learn by Doing Lab (2)

Approved Electives (23-26 units). Take courses from the following list to fulfill degree requirements:

Some courses on list require other courses on the list as prerequisites.

- BIO 200 Special Problems for Undergraduates (1-2)
- BIO 327 Wildlife Ecology (4)
- BIO 330 Extended Field Biology Activity (1-3)
- BIO 351 Principles of Genetics (5)
- BIO 361 Principles of Physiology (4)
- BIO 400 Special Problems for Undergraduates (1-2)
- BIO 401 Conservation Biology (4)
- BIO 414 Evolution (4)
- BIO 415 Biogeography (4)
- BIO 419 Analytical Methods in Ecology (4)
- BIO 434 Environmental Physiology (4)

BIO 442 Behavioral Ecology (4)
BIO 443 Molecular Ecology and Conservation Genetics (4)
BIO 444 Population Ecology (4)
BIO 445 Community Ecology (4)
BIO 446 Ecosystem Ecology (4)
BIO 450 Undergraduate Laboratory Assistantship (1-4)
BIO 452 Cell Biology (4)
BIO 462 Senior Project - Research (2)
BIO 463 Honors Research (2)
BIO 470 Selected Advanced Topics (1-4)
BIO 471 Selected Advanced Laboratory (1-4)
BIO 472 Current Topics in Biological Research (1-4)
BIO/CHEM 475 Molecular Biology Laboratory (3)
CHEM 217 Organic Chemistry II (4)
CHEM 218 Organic Chemistry III (3)
CHEM 313 Survey of Biochemistry and Biotechnology (5)
CHEM 331 Quantitative Analysis (5)
CHEM 341 Environmental Chemistry: Water Pollution (3)
CHEM 371 Biochemical Principles (5)
CHEM 372 Metabolism (4)
CHEM 400 Special Problems for Advanced Undergraduates (1-2)
CSC/CPE 101 Fundamentals of Computer Science I (4)
CSC/CPE 102 Fundamentals of Computer Science II (4)
CSC/CPE 103 Fundamentals of Computer Science III (4)
EE 201 Electric Circuit Theory (3)
EE 321 Electronics (3)
ENGR/SCM 350-The Global Environment (4)
ENGR 400 Special Problems for Undergraduates (1-2)
ENVE 330 Environmental Quality Control (4)
ENVE 434 Water Chemistry and Water Quality Measurements (4)
GEOG 317 The World of Spatial Data and Geographic Info Technology (4)
MATH 143 Calculus III (4)
MATH 244 Linear Analysis I (4)
MCRO 436 Environmental Microbiology (4)
MSCI 324 Marine Mammals, Birds, Reptiles (4)
MSCI 330 Technologies for Ocean Discovery (4)
MSCI 401 Marine Sciences Outreach Experience (2)
MSCI 410 Scientific Diving (3)
MSCI 440 Communicating Ocean Science for Informal Audiences (3)
MSCI 428 Marine Conservation and Policy (4)
MSCI 437 Marine Botany (4)
MSCI 438 Aquaculture (4)
MSCI 439 Fisheries Science and Resource Management (4)
NR 321 Water Systems Technology, Issues and Impacts (4)
NR/CRP 404 Environmental Law (3)
PHYS 400 Special Problems for Undergraduates (1-2)
SCM 302 Learn by Doing Lab (2)
STAT 323 Design and Analysis of Experiments I (1)
STAT 324 Applied Regression Analysis (4)
STAT 330 Statistical Computing with SAS (4)
STAT 331 Statistical Computing with R (4)
ZOO 322 Ichthyology (4)
ZOO 336 Invertebrate Zoology (4)

Appendix: Table 1. Matrix – Comprehensive Assessment Plan

Institutional Learning Outcomes (ILOs) Cal Poly ULOs	Program Learning Outcomes (PLOs)	Corresponding Student Learning Outcomes (SLOs)	Course(s) Where SLOs are Assessed	Assessment activities (to measure each SLO)	Suggested assessment tools	Assessment schedule – how often SLOs will be assessed	How will data/ findings be reported?	Designated personnel to collect, analyze, and interpret	Program findings dissemination schedule	Anticipated closing the loop strategies
Demonstrate expertise in scholarly discipline and understand the discipline in relation to the larger world Think critically and creatively	1. Integrate and synthesize information from the various marine disciplines	1. Identify, explain, critically evaluate and apply to problem solving principles, methodology, theories and literature from multiple disciplines in marine sciences	CHEM 302 MSCI 328 MSCI 428 MSCI 439	Exams term papers, lab reports or projects	Rubrics for papers or reports with criteria based on SLOs	PLOs and associated SLOs will be assessed every three years (two PLOs each year)	Report on percentage of students that meet or exceed a minimum level established learning outcomes for each PLO/SLO.	Faculty teaching specific courses Assessment committee comprised of faculty and staff	Annual Program retreat for all faculty and review by Academic Assessment Council Review by Academic Programs Office as part of program review.	We will implement a continuous improvement process based on results of assessment data.
Engage in lifelong learning and have an awareness of sustainability Demonstrate expertise in field.	2. Recognize and value the diversity of marine life and ecosystems	1. Classify, organize, evaluate and compare the structures and function of major life forms in the ocean 2. Describe how these life forms interact with one another and the ocean ecosystem	Diversity electives	Exams, term papers or lab reports	Rubric for written reports with criteria based on SLOs	Complete cycle of assessment in 3 years	Graduate status reports will determine success of graduates at securing positions in industry			
Think critically and creatively. Demonstrate expertise in the scholarly discipline.	3. Apply the scientific method, by formulating hypotheses, making predictions, and assesses, analyzing, synthesizing, and interpreting data	1. Design, conduct, evaluate and compare experimental approaches to scientific observation, hypothesis testing, data acquisition and statistical analysis in marine systems	MSCI 328 MSCI 439 BIO 462	Exams, term papers, lab reports or oral presentations	Rubrics for written reports or oral presentations with criteria based on SLOs	Surveys/ Interviews of graduating seniors each year. Surveys of alumni every 3 to 5 years				
Communicate effectively. Make reasoned decisions based on an understanding of ethics, a respect for diversity, and an awareness of issues related to sustainability. Use knowledge and skills to make a positive contribution to society.	4. Communicate marine scientific principles and research findings effectively to diverse audiences verbally and in writing	1. Demonstrate and apply excellent written, verbal, and listening communication skills. 2. Demonstrate the ability to work in a professional communications setting through experiential learning (i.e. internships, work experience, outreach events)	MSCI 401 MSCI 440 BIO 485	Written term papers, lab reports, oral presentations or projects.	Rubrics for written reports or oral presentations with criteria based on learning outcomes					
Work productively as individuals and in groups. Demonstrate expertise in scholarly discipline and understand that discipline in relation to the larger world.	5. Demonstrate proficiency in lab and field techniques relevant to marine sciences	1. Use basic field and lab equipment to gather data on biological, chemical and physical characteristics of the ocean	MSCI 303 MSCI 328 BIO 462	Laboratory practical exams, field exercises and projects	Rubrics for practical examinations and projects with criteria based on SLOs					
Engage in lifelong learning.	6. Locate and utilize bibliographic resources and demonstrate the ability to evaluate scientific literature	1. Procure, explain and critically evaluate primary literature and key theories in the marine sciences	MSCI 303 MSCI 328 BIO 461 BIO 462	Written term papers, lab reports, or projects.	Rubric for written reports or oral presentations with criteria based on SLOs					

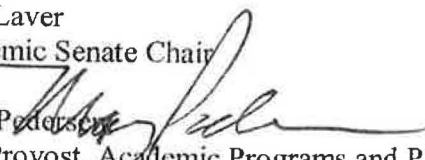


Academic Programs and Planning

Tel 805 756-2246

Fax 805 756-2367

To: Gary Laver
Academic Senate Chair

From: Mary Petersen 
Vice Provost, Academic Programs and Planning

Subject: Academic Senate Review of BS Marine Sciences Degree Proposal

Date: March 2, 2015

We are respectfully asking your consideration of expediting the last steps in the campus curricular review of the BS Marine Sciences Degree proposal through the Academic Senate Executive Committee and the Academic Senate. The degree proposal was approved by the Academic Senate Curriculum Committee in February 2015. Once the proposal is approved by the Senate, the Academic Programs office can then forward the degree to the Chancellor's Office (CO) for review. This CO review process can take anywhere from 2-8 months to complete.

Our initial goal was to have the degree available for freshmen students starting in Fall 2016 but this requires an expedited review at all levels. All of Cal Poly's admission processes and input of PeopleSoft components would need to be completed by early summer 2015 to reach this goal.

We appreciate your consideration of this request. Please contact our office with any questions or concerns. (805) 756-2246.

2015-17 Catalog Changes

College of Agriculture, Food and Environmental Sciences

Note: The following curriculum changes, unless otherwise noted, have been recommended for approval by the Academic Senate Curriculum Committee.

* In this context, a program refers to a degree program, concentration, specialization, minor or certificate.

Summer 2015

I. PROGRAM CHANGES (Added, Edited, Deactivated)

Department	Program*	Change	Notes
Wine and Viticulture	Wine and Viticulture Minor	Deactivate	

II. CURRICULUM CHANGES (addition/deletion of non-departmental courses)

Program*	Change	Notes
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III. COURSE CHANGES

Course Number, Title	Add/Edit/Deactivate	GE, USCP, Online	Notes
College of Agriculture, Food & Environmental Sciences:			
AG			
Agribusiness Department:			
Agricultural Education & Communication Department:			
Animal Science Department:			
BioResource & Agricultural Engineering Department:			
Dairy Science Department:			
NR			
NR 264: Natural Resources Economics	New Course	GE D2	Not recommended for approval