Interface Disciplines Work Group
Cal Poly Strategic Plan

Introduction

The Interface Disciplines Working Group is a group of 20 faculty members (see Appendix A) who agreed to examine current programming and suggest future ways to support and foster interdisciplinary work among students, faculty, departments and colleges across the campus.

The Working Group was appointed by Provost Durgin and given a charge to gather “interface” opportunities (see Appendix A). While the charge memo suggested using an RFP procedure to solicit interface project proposals, the Working Group proceeded with a data-gathering procedure in order to be better informed on the issue(s) related to this overarching university strategic outcome.

Working Group Procedures

All members of the Interface Working Group, before meeting, completed a department inquiry regarding interdisciplinary activities with which they had familiarity (see Appendix B and Appendix C). In all, 16 departments were represented, including the work of more than 35 faculty members. The survey data were collated and combined into a table of example interfaces at the student, faculty, course, department, department major and across department majors levels (see Appendix D).

At the first meeting of the group, the charge and the definition of “interface” were discussed with attention to the existing projects and programs already underway in an interdisciplinary way. After review of the primary components of Cal Poly’s work toward achieving a higher level of these types of educational opportunities for students and faculty, it was determined that several structural and contextual areas needed further investigation.

Four teams of Working Group faculty agreed to expand the knowledge base of this subject by preparing reports for further discussion (see Appendix E for minutes of the meeting).

The four areas were: Historical Perspective of University Activities (Mary Armstrong, Jasna Jovanovic, Patrick Lin); Faculty Involvement (Eric Mehiel, Diana Stanton); Fostering Interdisciplinary Learning Opportunities Through Minors, Certificates, and Streams (Jane Lehr, Brian Self); and, Financial/Administrative Considerations (Roberta Herter, Gerry DeMers).

At the second group meeting, faculty reported on each of the four areas of interest. From the combined responses from each report, the Working Group felt that several important themes arose consistently across the "achieving interface" activities goal.

Findings
From History: Cal Poly has several routes to interdisciplinary collaborations at student and faculty levels suggesting initial interest in creating structures to support combined work and interface opportunities. Though they may “depend on proximity, independent efforts and some luck” the possibility of expanding existing interdisciplinary work such as that of the UNIV courses taught in 2005 could continue with appropriate attention to the outcomes of what is in place already. (See Appendix F for the full report.)

From Faculty Involvement: What motivates faculty to engage in work with other faculty/departments/academic units or students outside their home department? Time, money, credit toward RPT. If these elements are to be supportive of faculty seeking interdisciplinary opportunities, they must be altered to provide the appropriate incentives, recognition, and guidance. (See Appendix G for the full report.)

From Fostering Interdisciplinary Learning: University models exist where minors and certificates can serve to combine disciplines, especially between technical and social fields. With attention to the General Education format, students are “more likely to be multi-disciplinary, rather than interdisciplinary” which could be modified to lead to, as an example, streamed GE courses where 3-4 GE courses would be centered around a specific theme such as sustainability, globalization, ethics, etc. (See Appendix H for full report.)

From Financial/administrative Considerations: Whatever changes are made to foster the process of interface program efforts, the structural support must be determined including faculty release time, staff needs, budget and costs, and would require benefit analysis to provide evidence of improved scholarly achievement. (See Appendix I for full report.)

It was the Working Group’s combined opinion that structure and finance play major roles in successful collaborative endeavors; that existing channels within Cal Poly can be utilized with this goal in mind including CTL, senior projects, websites and workshops, and with faculty recognition through value of and credit for achieving successful interdisciplinary outcomes.

**Recommendations**

The Interface Working Group recommends that the strategic plan be formulated to explore and expand the university’s support for innovative and creative new interdisciplinary efforts by faculty, departments, colleges and the university as a whole with the idea of graduating students with diverse exposures to disciplines other than those currently identified.

The Working Group would like the plan to emphasize continuation and reinforcement of the existing mechanisms and programs that meet goals in this area while at the same time changing key restrictions and limitations on programs and faculty who wish to pursue interface opportunities.
In the Strategic Plan as it is formulated, example tactics may include, but are not limited to, such items as:

provision of RFPs to faculty who wish to propose new interdisciplinary projects, majors, courses, and other levels of interactivity;

creation of a Clearinghouse for university documentation of existing and proposed interface projects, which includes interested faculty, faculty areas of expertise, assessment tools for program success measurement;

utilization of CTL and other existing campus resources to enhance interdisciplinary expertise, particularly with regard to faculty and student preparation for interface work;

systematic examination of colleges and universities with highly successful interface experience, using the graduate college, student investigations, and other means to determine and disseminate new ideas for such projects/majors/outcomes;

using existing and new data collection processes to determine 'cutting edge' fields for initial/continuing interdisciplinary work such as in technology and social science, health and sustainability, etc.

Summary

Because cross-department, cross-college, and cross-university examples already exist on an Ad Hoc basis, the Interface Working Group believes that when structural components have been addressed and when resources are focused with this goal in mind, Cal Poly has the imagination of students, faculty, administration, and community to provide successful interdisciplinary education.
APPENDICES A through I
Cal Poly Strategic Plan Working Group on Interface Disciplines

Increasingly, new curricular opportunities become apparent at the interfaces between existing disciplines, especially those between technological and societal fields. Examples might include theater technology, technical, scientific, and professional communications, entrepreneurship, technology and public policy, and environmental policy and development. The Working Group on Interface Disciplines should issue an RFP to the faculty, receive and evaluate proposals, and recommend, in priority order, those worthy of receiving funding for development as new degree programs. Proposed degrees could be either undergraduate or graduate, should be innovative, should involve educational technology where appropriate, should maximize use of existing strengths and resources, and must include cost analyses and assessment plans.

The Working Group should be prepared to present its findings at a special session of the Academic Senate meeting on April 29, 2008. There will be five Working Groups making presentations so you should plan for a 10 minute presentation with 10 minutes of discussion.

It is important that the Working Group conduct its deliberations in light of cross-cutting issues important to our university. They are diversity, sustainability, interdisciplinary collaboration, faculty workload, student success/retention/graduation, quality of life, and community citizenship.

The members of the Working Group are:

Doris Derelian (Chair), Food Science and Nutrition
❖Jerry DeMers, Kinesiology
  Dan Peterson, Animal Science
❖Mary Armstrong, Women’s Studies
 Lynne Slivovsky, Electrical Engineering
❖Jasna Jovanovic, Psychology and Child Development
  Jane Lehr, Ethnic Studies
 Blair London, Materials Engineering
❖Pat Lin, Philosophy
❖Greg Barata, Music
❖Tracy Thatcher, Civil and Environmental Engineering
❖Thomas Rice, Earth and Social Sciences
  Will Hughes, Materials Engineering
  Clint Staley, Computer Science
❖Michael Haungs, Computer Science
❖Brian Self, Mechanical Engineering
 Anita Hernandez, Education
 Lou Tornatzky, Industrial Technology
❖Roberta Herter, Education
❖Diana Stanton, Theater and Dance
 Eric Mehiel, Aerospace Engineering
❖Raul Cano, Biological Sciences
Working Interface Group Response Document

Name/Department

1. Identify WITHIN YOUR DISCIPLINE(S) current “interfaces” that are already in place or about to be underway. This might include current collaborations; themed interface areas/projects, for example part of the sustainability theme now on campus; across department teaching/project work with students or in research.

2. Identify ACROSS DISCIPLINES potential interface areas without regard to just your own department, but department-to-department, college-to-college, and campus-wide. Answer the question: What interfaced outcomes could we accomplish across boundaries, if we were to include these potentials into the next strategic plan?
Working Interface Group Response Document

Jane Lehr, Ethnic Studies

1. Identify WITHIN YOUR DISCIPLINE(S) current "interfaces" that are already in place or about to be underway. This might include current collaborations; themed interface areas/projects, for example part of the sustainability theme now on campus; across department teaching/project work with students or in research.

Note: Ethnic Studies is an interdisciplinary field, and thus we are continually negotiating disciplinary boundaries in our work as teachers and scholars. Here is a list of some recent examples of our efforts to support this type of interdisciplinary inquiry and practice:

- Exhibit @ Kennedy Library: Collaboration between ES and Special Collections April 17-June 16: Chismearte Y Que: Expanding L.A.’s Chicano Aesthetic – Project led in ES by Chair Victor Valle (Opening Reception 4:30-6:00 pm, Apr 24)

- The Community of Scholars: Gatherings of American Indian and Indigenous Students & Mentors is a program co-founded by Kate Martin, (Ethnic Studies, CP), Linda Billey-Sevedge (California Indian Education Association) and Linda Murray (UCSB Graduate Division) for the support and mentorship of American Indian and Indigenous high school, undergraduate and graduate students. Community gatherings occur three times a year with additional projects such as the publication of Osiyo and the Summer Study Program. This program is a week long plant restoration project at a Tribal College in North Dakota that will be funded by the Colleges of Agriculture, Liberal Arts, and the Earth & Soils, Ethnic Studies, Forestry and Natural Resources, and agriculture departments. In addition, Dr. Martin (ES) and Dr. Lynn Moody (Earth & Soils, CP) will lead the program. (See http://cofscholars.org/)

Sponsors for Community of Scholars program include: Cal POLY Ethnic Studies Department, College of Liberal Arts, & Student Affairs, American Indian Students Association, Cal Poly American Indian Science and Engineering Society, UCSB Graduate Division, EOP & the American Indian Cultural Resource Center, The California Indian Education Association and Cuesta College

- Osiyo is a literary and aesthetic journal sponsored by the Ethnic Studies Department. An upcoming issue will feature submissions from the Community of Scholars network. (Osiyo means “hello” in the Cherokee language.)

- ES faculty member Elvira Pulitano (with Kate Martin) is organizing a large-scale conference to take place in 2008-09 AY that will bring European Scholars in Indigenous Studies to Cal Poly to interact with U.S. scholars and indigenous students and activists.

- A new faculty member (Jane Lehr) is involved with an emerging interdisciplinary collaboration at Virginia Tech creating theatrical performances about contemporary social and ethical controversies related to science and technology (TWISTS: The Theatre Workshop in Science, Technology & Society) – there is some discussion about ways to grow this project at Cal Poly. (The collaboration is between experts on the social and technical dimensions of science and technology, theatre arts practitioners, and public(s)).
frameworks & knowledge from the social sciences and humanities can be brought to bear on scientific and technical knowledge, education, and practice (and vice versa).

- It would also be useful if there were better support for faculty to teach courses (individually) in other depts. Currently, this ability for us to teach in other departments is hampered by the types of accounting measurements in place. As interdisciplinary scholars, it would be fantastic to have the opportunity to teach in other ‘home disciplines’ on a regular basis – both for us and the students.
Working Interface Group Response Document

Name/Department: Jasna Jovanovic, Psychology & Child Development

1. Identify WITHIN YOUR DISCIPLINE(S) current “interfaces” that are already in place or about to be underway. This might include current collaborations; themed interface areas/projects, for example part of the sustainability theme now on campus; across department teaching/project work with students or in research.

Several faculty are engaged in research collaborations with colleagues across campus (e.g., with Education, Agriculture, Engineering, Business, Engineering).

One example is a collaborative proposal Mary Armstrong, Nilgun Sungar (Physics) and I have submitted to NSF to assess the climate for women STEM faculty at Cal Poly.

I’m aware that one of our faculty collaborates with colleagues in business on the Thailand abroad program.

Several of our classes are cross-listed with WS or Education.

2. Identify ACROSS DISCIPLINES potential interface areas without regard to just your own department, but department-to-department, college-to-college, and campus-wide. Answer the question: What interfaced outcomes could we accomplish across boundaries, if we were to include these potentials into the next strategic plan?

Certainly, research collaborations lend themselves to interdisciplinary initiatives. But we need to find ways to facilitate this so that more faculty, particularly junior faculty can more readily find ways to engage in such collaborations.

Start with finding ways more easily cross-list courses. The X courses allow for interdisciplinary efforts. Are there other ways to do this?
Working Interface Group Response Document

Name/Department: Antonio G. Barata / Music Department

Identify WITHIN YOUR DISCIPLINE(S) current “interfaces” that are already in place or about to be underway. This might include current collaborations; themed interface areas/projects, for example part of the sustainability theme now on campus; across department teaching/project work with students or in research.

Music in many ways is interdisciplinary, and therefore our program elides not only the obvious mastery of performance technique, but historical research, creative composition, theoretical exploration. Music easily crosses into other performing arts, finding obvious connections with theatre and dance. What might not be so quickly cited is its connection with acoustics (physics), electronic media (electroacoustic music), computer science (computer music), marketing (ad jingles, etc.), manufacturing (CD production), mathematics (tuning), performance venues (architecture), song writing (language for lyrics), criticism (journalism), musicology (history), etc.

I would say specifically in my department, we have most often interfaced with architecture, business computer science, dance, physics, and theatre.

A significant example of an interface project is RSVP Productions, for which I am the Artistic Director. This yearly project incorporates the talents of my Theatre & Dance colleagues and students, and the academic demographics of the students who participate is very wide indeed, truly a cross-section of virtually all majors, with one possible exception, agriculture....although I have even had some of them curiously involved!

2. Identify ACROSS DISCIPLINES potential interface areas without regard to just your own department, but department-to-department, college-to-college, and campus-wide. Answer the question: What interfaced outcomes could we accomplish across boundaries, if we were to include these potentials into the next strategic plan?

I would really like to see even further growth in the connections already mentioned. I believe particularly a stronger bridge should be built between business and music. I am sure a sizeable population of students would be interested in such a development. I would very much like to see impediments to team teaching lessened administratively. There do not seem to be mechanisms for putting together robust multi-disciplinary courses. Financial considerations, chasing SCU’s for example, that kill these ideas on the vine. How about a course in song writing that was team taught by a language department lyricist and a music department composer? How about a music business course being
Working Interface Group Response Document

Name/Department: Diana Stanton  Theatre and Dance

1. Identify WITHIN YOUR DISCIPLINE(S) current “interfaces” that are already in place or about to be underway. This might include current collaborations; themed interface areas/projects, for example part of the sustainability theme now on campus; across department teaching/project work with students or in research.

In Theatre and Dance we have had a few chances to “workshop” or collaborate on rehearsal projects. For example, as a movement person, I have gone into play rehearsal to coach actors on their physicality. Because of the nature of Theatre, we regularly collaborate with design, movement, vocal work, music etc. to produce our work. We have discussed a collaborative and team-taught class on “New Performance Development” that will include the above disciplines in one class that focuses on the creative process. We are currently discussing the possibilities of this class. Also, a performance project for next year’s Dance Concert involving collaboration with another faculty musician/composer is in the preliminary planning stages.

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The Fine and Performing Arts are in their nature, very ripe for interesting and dynamic collaborations among many disciplines. Using almost any idea as resource for creativity, the arts have reflected and showcased the spirit of the times, culture and history etc. For example, last year in my Modern Dance Repertory class, the students and I used a model and diagram of the combustion of a rocket engine (that one of the students was working on in her aerospace engineering class) to develop a lengthy dance sequence based on the engine’s principles and design. It turned out to be a fascinating part of the dance, and because the student had “danced” what she was studying, she felt she ultimately understood the engineering material better. We addressed, visual, auditory and kinesthetic learning styles in this process.

Potential interface areas I think would be interesting:
Dance and Psychology – movement and expressive arts therapy is gaining popularity
Dance and Music
Dance and Kinesiology – body mechanics
Theatre and Dance and Literature
Theatre and Dance and Ethnic Studies/Gender Studies
Theatre and Dance and Art and Design
Theatre and Dance with Technical Writing – integrated media arts
Working Interface Group Response Document

Name/Department: Dr. Patrick Lin, Philosophy Dept.

1. Identify WITHIN YOUR DISCIPLINE(S) current “interfaces” that are already in place or about to be underway. This might include current collaborations; themed interface areas/projects, for example part of the sustainability theme now on campus; across department teaching/project work with students or in research.

In the philosophy department, we already have natural interfaces with other disciplines through such course offerings as: philosophy of law, social & political philosophy, business ethics, ethics & education, biomedical ethics, philosophy of technology, philosophy of science, philosophy of space, time & matter, environmental ethics, philosophy of religion, ethics, gender & society, Asian philosophy, and others.

In the 2007-2008 academic year, we plan to offer a technology ethics course (as different from philosophy of technology in that the ethics course focuses more on issues arising from specific technology applications), helping to connect our discipline to others at Cal Poly—particularly relevant given the emphasis on science and technology here.

In this current academic year, we have already secured the College of Liberal Arts’ first grant through the US Office of Naval Research/C3RP (Cal Poly Technology Park) initiative for $30,000+ to study ethical issues related to autonomous military robots that are expected to play a significant role in conflicts within a few years. This project includes two members of the philosophy faculty (Patrick Lin and Keith Abney) and one from biomedical engineering (George Bekey, also a professor emeritus at USC), in addition to outside collaborators at Yale, Indiana Univ., and the US Naval Academy.

We also have a US National Science Foundation grant proposal under review related to privacy and trust issues arising from nanotechnology. The project team includes: Patrick Lin (Philosophy), Jane Lehr (Ethnic Studies), and outside collaborators that include a law professor and a bioethics expert. Other federal grant proposals are planned for this year.
Working Interface Group Response Document

Name/Department: Mary A. Armstrong
Chair, Department of Women’s and Gender Studies

1. Identify WITHIN YOUR DISCIPLINE(S) current “interfaces” that are already in place or about to be underway. This might include current collaborations; themed interface areas/projects, for example part of the sustainability theme now on campus; across department teaching/project work with students or in research.

Women’s and Gender Studies defines itself in part as an “interdiscipline.” The WGS department has 4 jointly appointed faculty (appointed between WGS and English, Philosophy, Ethnic Studies and Religious Studies). Additional WGS courses are taught by faculty from 6 other departments (History, Political Science, Art and Design, Kinesiology, Psychology and Speech Communication).

We currently include an array of courses that work across disciplinary boundaries. These include:

WS/PSY 314 Psychology of Women
WS/SOC 311 Sociology of Gender
WS/RELS 370 Religion, Gender and Society
WS/ES 350 Gender, Science, Race and Technology
WS/HIST 434 American Women’s History to 1870
WS/HIST 435 American Women’s History from 1870
WS 311 Women in Global Perspective
WS 401 Seminar in Women’s Studies
WS 340 Sexuality Studies

2. Identify ACROSS DISCIPLINES potential interface areas without regard to just your own department, but department-to-department, college-to-college, and campus-wide. Answer the question: What interfaced outcomes could we accomplish across boundaries, if we were to include these potentials into the next strategic plan?

I believe there are numerous key areas of academic research and teaching where there is extremely high potential for Women’s and Gender Studies to interface effectively across campus boundaries. It is probably possible to construct a useful bridge between WGS and almost any specific discipline, regardless of college. There are also numerous generative and promising broader links that could be made across larger campus units, many of which would speak directly and powerfully to institutional priorities. For starters, a few of these might include:
MS Degree in Environmental Forensics

The goal of the proposed multidisciplinary, professional Masters Degree is to prepare graduate students for jobs, both at private and public institutions, in the area of environmental forensics. The innovative degree in Environmental Forensics is a timely, and well-needed response to the global demand for environmental forensics problem-solving skills. The degree represents the first of its kind in the United States, it is comprehensive and academically rigorous. Additionally, it has the potential to evolve into a Ph.D. program in collaboration with other institutions in California or elsewhere in the US. This program is expected to meet the job demands for the next generation of environmental forensic scientists.

Environmental forensics encompasses all aspects of pollution and contamination in air, water, soil, and biota, and therefore, practitioners must have a sound training in a wide swath of science. A good scientific background is essential, for example, for understanding the issues related to certain contaminants, why they could be injurious to health, and the extent to which they can degrade in the ground to form potentially toxic contaminants. The legal part is at least as important as part of the job of environmental forensics scientists is to work closely with environmental law attorneys to assign (degrees of) culpability to offenders.

At the end of the two-year program, graduates will have acquired a skill set that would provide them with a competitive edge in the job market. The skills necessary to successfully compete in this ever-increasing and competitive job market are outlined in Table 1 below, along with the coursework necessary to acquire the skills.
Working Interface Group Response Document

Name/Department: Brian Self / Mechanical Engineering

1. Identify WITHIN YOUR DISCIPLINE(S) current “interfaces” that are already in place or about to be underway. This might include current collaborations; themed interface areas/projects, for example part of the sustainability theme now on campus; across department teaching/project work with students or in research.

Some of these will duplicate what Lynne Slivovsky will say, since much of my collaboration includes her. Most of my current interface work revolves around service learning. Lynne, Charles Birdsong, and I worked with students in CPE and ME to make an electronic travel aid for persons with poor vision. The system uses ultrasonic sensors (like bats using echolocation) to locate potential obstacles. This information is conveyed to the wearer via vibrotactors (like your cell phone on vibrate mode). Recently, we got an NSF grant with Kevin Taylor in Kinesiology. This grant will focus on senior design projects – working with kinesiology students, they will try to develop equipment that can increase adapted physical activity. Examples are a modified kayak that people with paraplegia can steer using a joystick, different attachments to the front of wheelchairs that allow the athlete to do adapted bowling, soccer, Frisbee golf, and baseball, and a cross country sit ski for an athlete on the US Paralympic Ski Team.

I have also discussed doing some work with Bob Clark in the kinesiology department on some biomechanics studies. Currently one Kinesiology student plans to work on the sit ski with me, and a Biomedical Engineering Honors student just finished a quarter of work on it.

Last year, an IE student also worked on a senior design team that developed a rotating chair to provide vestibular input to children with developmental delays.

2. Identify ACROSS DISCIPLINES potential interface areas without regard to just your own department, but department-to-department, college-to-college, and campus-wide. Answer the question: What interfaced outcomes could we accomplish across boundaries, if we were to include these potentials into the next strategic plan?

I would love to collaborate with some educational psychologists to help develop and assess new teaching methods. Certainly there are other potential collaborations in the service learning realm, but these may be difficult to fit into a full year long engineering senior design project. We could potentially have business majors try to market and sell the devices, and sociology students assess the impact of them.
Working Interface Group Response Document

Name/Department ____________________________

1. Identify WITHIN YOUR DISCIPLINE(S) current "interfaces" that are already in place or about to be underway. This might include current collaborations; themed interface areas/projects, for example part of the sustainability theme now on campus; across department teaching/project work with students or in research.

   1) Interactive Entertainment
      i. Games
      ii. Simulations
   2) Robotics

2. Identify ACROSS DISCIPLINES potential interface areas without regard to just your own department, but department-to-department, college-to-college, and campus-wide. Answer the question: What interfaced outcomes could we accomplish across boundaries, if we were to include these potentials into the next strategic plan?

   1) Interactive Entertainment
   2) Robotics
   3) RFID
   4) K-12 Education (STEM)
   5) GIS/GPS
Working Interface Group Response Document

Name/Department: Tracy Thatcher, Civil and Environmental Engineering

1. Identify WITHIN YOUR DISCIPLINE(S) current “interfaces” that are already in place or about to be underway. This might include current collaborations; themed interface areas/projects, for example part of the sustainability theme now on campus; across department teaching/project work with students or in research.

Although there are many potential areas of interface, there are no major current interfaces. There are collaborations in teaching with Mechanical Engineering (in the area of modeling) and Bio Engineering.

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The environmental engineering faculty is involved, as one of it’s core areas, in the field of sustainability. However, we have not been actively involved in interfacing with other areas. This seems a natural area for interfaces with policy, sociology, and psychology.

Another likely area would be in the field of education, where a collaboration between education and engineering faculty could lead to an increased understanding and interest in engineering amongst K-12 students.
Working Interface Group Response Document

Name/Department  Jerry DeMers Kinesiology

1. Identify WITHIN YOUR DISCIPLINE(S) current "interfaces" that are already in place or about to be underway. This might include current collaborations; themed interface areas/projects, for example part of the sustainability theme now on campus; across department teaching/project work with students or in research.

Center for Obesity Prevention and Education (COPE): Interface with Nutrition, Ag Business, Biology, Chemistry, Recreation Administration

Biomechanics interfacing with Engineering

Adapted Physical Activity interfacing with Engineering

Teaching Concentration interfacing with the College of Education

2. Identify ACROSS DISCIPLINES potential interface areas without regard to just your own department, but department-to-department, college-to-college, and campus-wide. Answer the question: What interfaced outcomes could we accomplish across boundaries, if we were to include these potentials into the next strategic plan?

Mechanical Engineering interfacing with COPE to develop exercise equipment for obese individuals.

Interface between the College of Engineering and CSM: Biomedical Engineering; Biochemical Engineering; Prosthetics (Mechanical Eng., Physics and Kinesiology)

Nutritional Kinesiology: combined degree.
Working Interface Group Response Document

Name/Department: Dan Peterson/ ASCI

1. Identify WITHIN YOUR DISCIPLINE(S) current "interfaces" that are already in place or about to be underway. This might include current collaborations; themed interface areas/projects, for example part of the sustainability theme now on campus; across department teaching/project work with students or in research.

Research Collaborations:

Within department, several interfaces exist between areas that are not traditionally mixed, such as applied veterinary medicine and cell and molecular biology.
Across departments:
ASCI – DSCI: proteomic research, cell biology
ASCI – BMED – DSCI: cell biology research, biomaterials development, tissue engineering applications, technologies
ASCI – PHYS: biomechanics, bone structure-function relationships

Instructional, educational interfaces:

By definition, AGB, AGED, BRAE, AGC

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Many disciplines lend themselves to interaction due to specific areas of overlap. For example,

- BMED and ASCI in terms of physiology and development of interventions and model systems for study.
- Similarly, ASCI and BIO and their use of identical technologies and approaches to studying divergent systems.
- FSN / ASCI in terms of molecular nutrition, nutritional biochemistry
Dr Doris Derelian

From: rherter@calpoly.edu
Sent: Tuesday, April 01, 2008 1:15 PM
To: derelian@calpoly.edu
Subject: Re: FW: TP Msg. #858 Interdisciplinary Teaching and Learning
Attachments: FW: TP Msg. #858 Interdisciplinary Teaching and Learning

1. Identify WITHIN YOUR DISCIPLINE(S) current 3'interfaces'2 that are already in
   > place or about to be underway. This might include current
   > collaborations; themed interface areas/projects, for example part of
   > the sustainability theme now on campus; across department
   > teaching/project work with students or in research.

   Teacher Education within the College of Education has long-standing and ongoing
   collaboration with the Colleges of Science and Math, Agriculture, Liberal Arts in credentialing
   post-bac students in the Single Subject program.

   >
   > 2. Identify ACROSS DISCIPLINES potential interface areas without
       > regard to just your own department, but department-to-department,
       > college-to-college, and campus-wide.

   Individual professors, such as Shirley Magnusson and Roberta Herter have research,
   assessment, and writing projects with the Colleges of Architecture and Engineering.

   Donald Maas contributes to the Center for Teacher and Learning, a cross-disciplinary venue for
   faculty development.

FW: TP Msg.
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Dr Doris Derelian

From: trice@calpoly.edu
Sent: Tuesday, April 01, 2008 11:46 AM
To: Blair London; Roberta Herter; Eric Mehiel; Gerry Demers; Greg Barata; Will Hughes; Lou Tornatzky; Diane Stanton; Jane Lehr; Lynne Slivovski; Raul Cano; Jasna Jovanovic; Patrick Lin; Brian Self; Clint Staley; Dan Peterson; Mary Armstrong; Michael Haungs; Tracy Thatcher; Anita Hernandez; derelian@calpoly.edu
Subject: Re: Thursday Mtg.

Doris et al.,

I can't be at the meeting on Thursday due to other commitments, but here are my short responses to the some of your questions.

"Working Interface Group Response Document"

Name/Department: Thomas J. Rice; Earth & Soil Sciences Dept.

1. Identify WITHIN YOUR DISCIPLINE(S) current “interfaces” that are already in place or about to be underway. This might include current collaborations; themed interface areas/projects, for example part of the sustainability theme now on campus; across department teaching/project work with students or in research.

The Earth Sciences major is an interdisciplinary effort among geologists, geographers and soil scientists from three departments (in three different colleges), Physics, Social Sciences and Earth & Soil Sciences.

2. Identify ACROSS DISCIPLINES potential interface areas without regard to just your own department, but department-to-department, college-to-college, and campus-wide.

The disciplines of soil science, earth sciences, geology, botany, and biology all interrelate and many existing Cal Poly courses are already interdisciplinary in nature. Examples include BOT 121, SS 121, ERSC 144, GEOG 250, GEOL 102 and GEOL 201.

—END—

Respectfully submitted,
Tom

Thomas J. Rice, Ph.D., C.P.S.S.
Professor of Soil Science
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Earth & Soil Sciences Dept.
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Memorandum

TO: Interface Disciplines Working Group

FROM: Doris Derelian, Chair

Date: 7 April 2008

RE: Meeting of 4/3 recap
(For those absent, see attached copies of "homework" assignments and summary grid)

Thank you to members of the working group who were able to attend our first meeting. We were able to get some clarity about creating a strong report to Provost Durgin and the Academic Senate on April 29th.

We discussed the following items (in capsule form here):

A. Defining “Interface” as representing “interdisciplinary” “collaborative” “interactive” and based on both demands of the university such as the university academic outcomes, university initiatives (sustainability, diversity, student retention/graduation, faculty workload, as well as requirements of external accreditors for key university programs such as engineering.

B. Examining our current activities regarding those disciplines where there already exists good on-going collaborative efforts. Additionally, looking at campus examples of imbedded interdisciplinary work such as General Education.

C. Working group members agreed to examine some challenging issues in preparation for our next meeting:
   1. New models of bringing students and faculty into a more robust interfaced experience (Brian Self, Jane Lehr) including but not limited to: core courses, “streams,” integrated majors
   2. Examining of historical university experience in interface activity (Mary Armstrong with others)
   3. Faculty involvement issues such as RPT, incentives (Eric Mehiel, Diana Stanton)
   4. Assessing various financial/administrative considerations to help identify existing and possible barriers (Jerry DeMers, Roberta Herter).

5. Next meeting for reports and determining material for draft communication to Provost Durgin and Academic Senate. Meeting in CAFES Dean's Conference Room 11-210, at 12 noon APRIL 15th. Light refreshments available.
Interface Disciplines Group
April 11, 2008
(Very) Quick History of University Activities
Mary Armstrong, Jasma Jovanovic, Patrick Lin

Quick Historical View

1. Established Programs

Although individual or small group ID efforts are scattered across Cal Poly, there are several independent programs and some degree programs (within/across departments) that are structured specifically for interdisciplinary work. A (probably partial) list:

Programs/Depts:
Comparative Ethnic Studies Department (new BA)
Liberal Arts and Engineering Studies Program (new BA)
Women's and Gender Studies Department
[Media Arts MA Program—forthcoming?]

ID Degrees:
Earth/Soil-Physics-Social Sciences (BS)
Nutrition/Kine (BS)
Food Systems (BS)
Environmental Forensics (BS)
Liberal Studies (leading to multiple subject credential) (BA, BS)
Agricultural Science (leading to single subject [agriculture] credential) (BA)
Interdisciplinary Studies (adult degree program, Continuing Education) (BA)

2. Curriculum-based Efforts: UNIV Courses

UNIV courses were established through the Academic Affairs Office (via David Conn); the first UNIV courses were taught in 2005. UNIV courses are specifically intended to create a space where interdisciplinary classes may more easily be supported and will fit into the Cal Poly catalog. The courses can be proposed in the regular catalog cycle and are typically GE courses. See below (page 3) for procedures related to proposing UNIV courses.

Other attempts at development of interdisciplinary courses seem to depend upon proximity, independent efforts, and some luck. The one exception to this is the newly established on-line link-up of sustainability related courses. Academic Programs worked with the Senate Sustainability Committee to develop the http://suscat.calpoly.edu/ website, a centralized information source for students interested in sustainability courses (or for faculty who want to see what is being taught). This level of organization is (we think) unique here.

3. Other Structures that Enable New Collaborations (Not Curricular-based)

An historical view quickly reveals that at least the majority of interdisciplinarity efforts at Cal Poly are either a) curricular or b) products of connections made by individuals who can find others with common interests, or who have grant funding that provides the resources needed to reach out, make connections, etc.
“UNIV” COURSE CRITERIA

While it is not essential that all criteria be satisfied, the selection of UNIV course offerings will be based on the existence of a reasonable fit with the following (which are listed in no particular order):

I. Courses should appeal to a wide range of students. (Typically they should be GE and/or USCP certified, with a targeted student audience from majors that are in at least two different colleges.)

II. Courses should be team-taught or, at a minimum, have the potential to be taught at different times by individuals from different colleges.

III. Courses should be available to as many students as possible, depending on the nature of the course and the number of instructors involved. (For example, a writing-intensive course with two instructors should be offered in a section accommodating at least 46 students; a non-writing-intensive course with multiple instructors should accommodate a substantially larger number of students, possibly using "break-out" sessions or recitations for discussions or other activities.)

IV. Courses should address university-wide learning objectives (e.g., diversity, environmental literacy, sustainability, etc.).

Proposals for repeat offerings of UNIV courses will be considered; however, given limited funding at the present time, no long-term commitments can be made. Note: If the on-going pilot is judged successful (from faculty, student, and administrative perspectives), Academic Program's intent is to seek increased funding in the future, which may allow particular UNIV courses to be offered on a regular basis.

Instructors offering courses under the UNIV prefix are expected to conduct student evaluations in all sections.

PROCESS Requests for UNIV proposals are made annually (or more frequently, as needed) by Vice Provost David Conn.

Each submission should consist of:

1. The standard course description form (It is not necessary to re-submit this form if it was submitted in response to a previous UNIV solicitation, unless changes are being proposed.)

2. A memo specifying:
   a. a brief rationale for offering the course under the UNIV prefix, in light of the criteria listed above;
   b. the quarter (or quarters) in which the course would be offered;
   c. the targeted student audience;
   d. the number of students to be accommodated in a section;
   e. the names and departments of proposed instructors;
   f. the funding, if any, sought to replace each instructor (measured in WTUs).

The Academic Senate Curriculum Committee is involved in reviewing the proposals. Every effort will be made to complete the selection process, and notification of the results will be made in sufficient time for class scheduling purposes. The offerings will be subject to available funding, which may be sufficient to support up to 3-4 courses in each of the three AY quarters.
Interface Working Group - Faculty Involvement Subcommittee
Eric Mehiel and Diana Stanton

Definition:

Interface Activities – representing “interdisciplinary”, “collaborative”, “interactive” activities by faculty or students across academic units guided (or constrained) by demands of the university such as the university academic outcomes, university initiatives (such as sustainability and diversity), student retention and graduation rate, and faculty workload, as well as requirements of external accreditation boards for key university programs such as engineering.

Questions:
1. What motivates faculty to engage in work with other faculty/departments/academic units or students outside their home department?
   - Time
   - Money
   - Credit toward RPT
     i. promotion beyond tenure
     ii. value of interface activities in research, teaching and service as areas to make a case for tenure
   - Included in regular job activities

2. What policies or procedures exist to provide incentive or to discourage faculty from “interface” activities?
   - Current RPT discourages (no credit toward RPT)
   - No organizational structure to promote interaction among faculty
   - Little guidance on how to implement interface activities
   - Verbal encouragement from Dean’s and some senior faculty

3. Do students want to engage in interface activities, if so, must faculty members also be involved?
   - Yes. Students with interface experience stand out in the job market/interview (projects, classes, clubs)

4. What level of faculty involvement in interface activities exists at other similar institutions?

5. How do other similar institutions promote or discourage interface activities?

Proposed Solutions:
- Administrative Department to continually evaluate curriculum and allow for efficient and timely implementation of new interface classes and programs/streams/concentration/emphasis (not minor)
- Need a template or model of successful implementation of interface activity
- Need a strong academic unit (such as UNIV) to house interface courses and promote interface classes both inside and outside GE
Fostering Interdisciplinary Learning Opportunities
Through Minors, Certificates, and Streams

April 14, 2008
Jane Lehr & Brian Self

The existing description of the Interface Disciplines Working group focuses entirely on new interdisciplinary degree programs. Our committee was charged with identifying other ways in which to identify, organize, and institutionalize potential opportunities for interdisciplinary education— in addition to the possibility of new interdisciplinary majors.

We acknowledge that the breadth of the current GE requirements creates the opportunity for a student to become interdisciplinary (to bring disciplines together and bring multiple types of expertise to bear on a given problem or project) – but the GE requirements do not mandate it. Thus, in most cases, GE courses equip the student with multi-disciplinary rather than interdisciplinary training. What we suggest is that it may be possible and beneficial to better support guided and intentional interdisciplinary exploration via the development of new minors, concentrations, certificates, streams, etc. in addition to/alongside existing GE requirements.

This does not inherently disrupt or seek to disrupt the GE requirements, frameworks, etc. – instead, we seek to provide increased and clarified resources for the development of interdisciplinary (integrated rather than multi-disciplinary) perspectives, and to identify the development of interdisciplinary perspectives as something that is valued at Cal Poly. At the same time, we acknowledge that given existing curricula requirements in colleges such as engineering and architecture, there is an attraction to the idea of fostering these interdisciplinary perspectives (major + outside perspective) via fulfillment of a subsection of GE requirements.

For this report, we have explored two different models of “less-than-a-new-major” modes: Minors & Certificates and Streamed GE Courses.

Mode 1: Minors & Certificates
The first “less-than-a-new-major” mode we explored is the possibility of creating new minors or certificate programs that create “interfaces between existing disciplines, especially those between technological and societal fields.” Some examples of minors with this mission at somewhat similar universities include:

- Gender, Science, and Technology Minors/Women, Science, and Technology Minors
  - Virginia Tech
    The program at VT offers 2 undergraduate minors – the Women’s Studies minor and the Gender, Science, and Technology (GST) minor. The GST minor requires interdisciplinary coursework in Women’s Studies and Science & Technology Studies.

1 RELATEDLY: Virginia Tech has a department of Interdisciplinary Studies offering a number of different minors. What is most innovative, perhaps, is the major in Interdisciplinary Studies – “an interdisciplinary undergraduate program leading to a Bachelor of Arts (B.A.) degree. Instead of specializing in a single area, IDST majors complete two approved minors or concentrations from among about seventy approved options, including those minors housed within IDST's programs.” What is particularly attractive about this idea is that it avoids the ‘disciplinary silos’ that often can (re)develop following the creation of new interdisciplinary fields – as each student can tailor their interdisciplinary degree to their interests. http://www.cis.vt.edu/
center administrator, has recommended that medical schools select more humanistic students.”

- Science, Technology and Society Minors
  - Many schools offer a general minor (and in some cases majors) in Science, Technology, and Society or Science & Technology Studies. These schools include: Clemson University; George Mason University; MIT; NC State; Penn State; RPI; Stanford; UC Davis; University of Michigan; University of Notre Dame; University of Wisconsin-Madison; and Virginia Tech.
  - The Colorado School of Mines offers an STS-type minor called ‘humanitarian engineering’ specifically geared for engineers. This minor includes courses as: Political Philosophy and Engineering; Cultural Dynamics of Global Development; Engineering Cultures in the Developing World; Technology and International Development; Humanitarian Engineering; and Environmental & Resource Economics – as well as track specialization in the U.S., Latin America, Asia, or Africa & the Middle East.
http://humanitarian.mines.edu/

Mode 2: Streamed GE Courses
The 2nd alternative we explored is the possibility of creating ‘linked’ or ‘streamed’ GE courses to fulfill a subset of GE requirements at Cal Poly. Many students treat their GE courses as a number of disjointed graduation requirements and do not value their intrinsic worth. This is especially prevalent among engineering students who often wonder how these courses will apply to their future careers. A set of 3-4 GE courses centered around a specific theme might help these students realize the importance of liberal studies in their future careers by providing explicit contexts for interdisciplinary exploration. We imagine that streams might include topics like sustainability; globalization; gender, race, science, and technology; and ethical decision-making.

As an example, there is one streamed pilot currently at Virginia Tech: Living in the 21st Century: “Earth Sustainability” Pilot Series – this series is part of the recently revised Core/GE Requirements at Virginia Tech, now called the “Curriculum for Liberal Education.” The Earth Sustainability core course series is “designed to integrate the goals of the university’s core curriculum in an interdisciplinary theme-based learning experience offered over two years.” Students complete 6 out of 7 core requirements if they complete this series of courses. “The Earth Sustainability course series explores issues surrounding the resources from which we produce food, safe water, energy, transportation, and shelter. It integrates knowledge from the natural sciences, social sciences, humanities, and engineering to understand humanity’s impact on the Earth’s systems.”
http://www.uccs.cen.vt.edu/
Interface Disciplines Working Group

Assessing various financial/administrative considerations to help identify existing and possible barriers.

1. A proposal would need to be submitted to the Provost's office that would include the following:
   a. Curriculum development plan
   b. Release time needed for existing faculty
   c. Budget and program needs
   d. Staffing needs
   f. Facility needs
   g. Number of new faculty needed for the program

2. The costs would be absorbed by the university system and possibly outside resources. A benefit analysis would follow implementation of programs and practices resulting from innovations.