California State Polytechnic University
College of Science Strategic Plan

Revised March, 2011

This plan is the product of a collaborative effort that incorporates input and ideas from College of Science faculty, students and alumni. The strategies outline below are compiled and updated from the results of all-College strategic planning sessions conducted during winter and spring of 2009.

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College of Science Overview

The College of Science at Cal Poly Pomona is a hub for discovery, application and commercialization of science, technology and mathematics. We are a community of scholars, students and practitioners working together to be the technical pacesetters of tomorrow.

Our faculty are accomplished across the range of scientific disciplines. They are also experienced at taking new ideas and putting them into practice. Faculty not only have patents and discoveries, but also have started companies to bring their innovations to market. Our curiosity is driven as much by improving people's lives as it is by improving our understanding of the world.

This focus on both discovery and application creates a dynamic environment for student learning. Our aim is to offer students from all walks of life the benefits of mastering science and mathematics with faculty who are actively creating new knowledge and new applications. Before they receive their degrees, our students gain hands-on experience in the work of their discipline. They work with faculty using the latest equipment and techniques and they have experience with putting theory into practice in real-world contexts. We are proud of our sustained record of preparing students to make their mark as researchers, teachers, entrepreneurs, and leaders. Our success is measured by the eagerness of business, government and postgraduate programs to recruit our graduates.

Mission Statement

The College of Science at Cal Poly Pomona will:

- Create an environment of discovery and innovation that provides undergraduate and graduate students with fundamental knowledge and skills to meet the scientific, educational, technological, and environmental challenges of a rapidly changing, multicultural world;
- Generate modern and evolving academic programs which include interdisciplinary curricula that emphasize a learn-by-doing philosophy for teaching scientific principles via classroom, laboratory, and field experiences;
- Advance scientific knowledge by promoting a creative and professionally active faculty of teacher-scholars and by engaging students in research;
- Serve the university and needs of the local and global communities by seeking and establishing partnerships with community organizations, governmental bodies, educational institutions, and the private sector.

Summary of our "Learn-By-Doing" Curricula

To facilitate its mission the College of Science offers versatile curricula built upon applications-oriented instruction or "Learn-By-Doing" methodologies. Our courses combine fundamental education in science or mathematics with a broad human outlook, aimed at developing the students' mental horizons beyond the limits of their immediate vocational objectives.

Each curriculum is designed to prepare graduates for specific professional positions in industry, government, and teaching or for graduate and professional work in their disciplines. The four-year sequence covers the basic major courses and has sufficient free electives to allow the students to develop specializations within the major and closely-related fields.

General education science courses are offered for all students. The need to understand the concepts of modern science and mathematics and their relationship to life in our present world is important. The College of Science also offers basic supporting courses for students enrolled in the professional and technological degree programs in other colleges of the university.

Majors in eight fields leading to the Bachelor of Science degree are offered by the College of Science. Information concerning the master's curricula may be found in the graduate listings.

The standard teaching credential program is offered for both the elementary specialization and the secondary specialization in a number of majors and minors.

A pre-professional program is offered for students preparing for medical, dental, or veterinary or other health career schools.

The College of Science actively fosters dialogue and joint research among campus scientists through special institutes and symposia. The Institute for Cellular and Molecular Biology, the Institute for Advanced Systems Studies, and the Lyle Center for Regenerative Studies are particularly active in these areas.

A student-centered co-curricular program includes the Science Council; Beta Beta Beta Biological honor society; Biological Sciences Club; Microbiology Club; a chapter of Kappa Mu Epsilon (mathematics); a chapter of student affiliates of the American Chemical Society; Society of Physics Students; Sigma Pi Sigma, national honor society in physics; Upsilon Pi Epsilon, national honor society in Computer Science; the Geology Club and other organizations.

Shaping Our Future in the College of Science

A steadfast commitment to the integration of teaching and research sets the College of Science apart from other institutions. All students are treated as working scientists. This requires intensive student mentoring; individualized instruction; dynamic, interdisciplinary faculty/student research collaboration at both the graduate and undergraduate levels; rigorous grounding in the fundamentals; partnerships with industry; strong encouragement to push the limits of knowledge in the lab, in the field, and in the classroom; and state-of-the-art facilities.

Students learn in the most direct way possible the arduous challenge of meticulous, often tedious research, research which frequently leads nowhere and often consumes months or years of effort, but on rare occasions results in thrilling discoveries. They come to realize that their own persevering curiosity and that miraculous moment of dazzling insight are what drive the scientific enterprise and that there is truly a community of science in which team effort and sharing of work and insights are crucial to success. Most of them are hooked for life.

This kind of education is critical for all students but it most powerfully transforms students who are underrepresented in technical fields. It is also one of the most labor intensive and expensive ways to educate and requires recruitment and retention of the outstanding faculty who are committed to teaching.

Partnership with generous private donors is therefore crucial to this work. Through alumni events, career fairs and invited speaking engagements the College of Science strives to maintain longstanding connections with its alumni and industry partners. Together we can transform the future.

Strategic Planning Template

The following template outlines our plan for accomplishing three strategic **Goals** of the College of Science. These goals incorporate most elements of the eight University Goals outlined in the August 2010 Cal Poly Pomona Strategic Plan. The template spells out several **Objectives** related to each goal and **Strategies** for meeting these objectives. Also listed are a variety of **Success Indicators** that may help track our progress toward attaining the objectives. This planning template is intended to be a "living document" that can be modified in response to changing conditions or external influences.

Goal 1: **Advance excellence in teaching, learning, and scholarship using our polytechnic learn-by-doing-approach**

(reflects University Goals #1 and #2, plus parts of Goals #4 and #8)

Objectives	Strategies	Success Indicators
1.1 Modernize and enhance laboratory and field-based courses to promote the learn-by-doing approach to teaching.	**a)** Invest in up-to-date technology and laboratory / field equipment. **b)** Hire new faculty w/ applied hands-on teaching expertise in classroom, laboratory, and field settings. **c)** Compare laboratory and field emphasis and available technology/field equipment with peer institutions. **d)** Get new Science Building on Master Plan, designed with most modern approach to making things functional, including science library within the College. **e)** Seek resources for laboratory, infrastructure and space needs. **f)** Enhance and foster support for curriculum and laboratory development (Funding for assigned time, supplies, equipment, etc.) **g)** Reward teaching excellence	• # of external grants and contracts. • Updated course descriptions, expanded course outlines, and prerequisites. • Addition of computational components to expanded course outlines. • Teaching and research equipment purchases. • Software upgrades, equipment calibrations, and maintenance contracts. • Improved / revised RTP document to reflect the evolving instructional and research trends of our faculty and community. • Learning outcomes assessments of curriculum changes. • Remodeling and acquisition of new classrooms with adequate seating, computer interface, and configuration allowing for multiple teaching styles. • Annual Distinguished Teaching awards
1.2 Enhance interdisciplinary curriculum development by encouraging interactions between departments and colleges.	**a)** Develop policies that promote interdisciplinary courses and scholarly activities **b)** Support joint appointments, cross-listed and co-taught courses, flexible curricula and new minor programs. **c)** Encourage double majors and multidisciplinary research projects.	• Participation in Lyle Center and Water Center • Approval of faculty searches. • Establishment of courses that allow for cross-departmental student research with appropriate dissemination of faculty supervisory units. • Development of a regular series of interdisciplinary faculty seminars and symposia.

		• Release time for new course development.
1.3 Enhance and foster support for faculty scholarship that engages students.	**a)** Encourage grant writing activities through reassigned time and staff assistance. **b)** Augment level of support for faculty and student travel. **c)** Develop, implement and actively promote graduate programs. **d)** Enhance and foster support for research with students (funding for supplies, equipment, etc.). **e)** Promote and track student presentations at professional conferences. **f)** Incorporate faculty participation in fundraising and outreach activities. **g)** Use student research in teaching pedagogy to enhance curriculum.	• Release time awards for grant-writing. • ICR funds directed to faculty PIs. • Development of a program of mentored faculty support groups based upon course sequences. • Improvement to departmental advising and scholarship programs. • # of students actively engaged in summer research activities.
1. 4 Develop an equitable faculty workload plan that is consistent with the Teacher/Scholar model.	**a)** Work toward implementation of a College-wide 9-3-3 model. **b)** Develop a release time plan and priorities consistent with the existing CSU policy. **c)** Perform comparative faculty workload analysis within other CSU College of Sciences.	• Strategy / motivational sessions with College faculty • # of WTUs generated by faculty activities. • Hiring of adequate staffing to maintain quality service to research-active faculty and students. • Workloads at CPP on par with research-oriented Science Colleges at other CSU campuses.

Goal 2: **Strengthen our diverse, learning–centered community to enhance interactions and embrace the future**

(reflects University Goals #3, #6 and part of #7)

Objectives	Strategies	Success Indicators
2.1 Encourage faculty and student participation in department, college and university level colloquia, seminars and forums, thus promoting scientific awareness on campus.	**a)** Promote in inter-college colloquia and other events. **b)** Disseminate our scholarship across campus via college forums and website. **c)** Foster student collaborative forums/seminars, including a College-wide seminar class. **d)** Utilize our outdoor and indoor spaces to create an inspirational learning environment.	• # of inter-college colloquia • # of college of science participants involved in campus-wide scholarship-related forums • Amount of web traffic at scholarship-related web sites • Generation of a college-wide seminar series for students • # of activities involving the college of science outdoor spaces & indoor spaces • # of students and faculty involved in college of science outdoor & indoor spaces
2.2 Encourage interactions between departments and colleges by joint appointments, cross-listed and co-taught courses, flexible curricula, new minor programs, and multidisciplinary research projects.	**a)** Encourage faculty to apply for interdisciplinary funding. **b)** Facilitate mechanisms for creating joint appointments between Colleges and Departments. **c)** Establish micro-centers of interest to faculty from different Colleges. **d)** Support curriculum tracks with cross-disciplinary emphases. **e)** Promote interactions between student clubs across disciplines.	• # of interdisciplinary proposals submitted • # of interdisciplinary proposals funded • Total $ obtained for interdisciplinary projects • # of faculty searches dedicated for joint appointments • # of joint faculty appointments • # of micro-centers involving the College of Science • # of cross-disciplinary curriculum tracks • # of cross-disciplinary student clubs
2.3 Promote a progressive curriculum that focuses on strategic growth areas.	**a)** Hire new tenure-track faculty in strategic growth areas. **b)** Survey industry employers and alumni to gauge future growth opportunities and hiring	• # of faculty hired in identified strategic growth areas • # of industry partners contacted

	trends. **c)** Enhance marketing and promoting for the strategic growth areas.	• Results of industry surveys • # of alumni contacted • Results of alumni surveys • # of events dedicated to promotion of strategic growth areas

Goal 3: **Deepen our engagement with our city, region, state, nation and world** (reflects University Goals #5, #6, #7 and #8)

Objectives	Strategies	Success Indicators
3.1 Encourage national and global engagement through research and teaching collaborations with collaborators from other states and countries.	**a)** Increase student and faculty activities that address global challenges that touch on natural sciences. **b)** Promote international programs with faculty input and design. **c)** Promote international / national outside expert collaborations. **d)** Recruit outside speakers to promote global importance of science disciplines. **e)** Promote faculty presentations to public and to local professional organizations. **f)** Increase funding for national and international travel for faculty and students.	• # of public events that promote science connections to resolution global challenges • # of faculty involved with international programs • # of external research and teaching collaborations • # of speakers presenting • Faculty presentations to general public • Faculty presentations to local professional organizations • Travel grants supporting faculty and student travel to national and international venues
3.2 Engage students and faculty in active learning pedagogies including undergrad research, study abroad, community-based learning, and internships.	**a)** Use student research in teaching pedagogy to enhance curriculum. **b)** Encourage and track number of student interns with industry.	• # of student presenters in College of Science research symposium • # of faculty publications in Education Research • Participation in annual "Stories of Successful Learning" colloquium • Contributions to service-learning activities • Spreadsheets for tracking student internships and post-internship employment

3.3 Enhance the student pipeline by fostering sustainable connections with K14, industry, and alumni for better recruitment, placement, and constructive feedback.	**a)** Maintain compilation of current employment opportunities. **b)** Establish connections with Alumni Relations and Student Recruitment divisions on campus. **c)** Encourage outreach programs with local community colleges, secondary schools, and grade schools **d)** Promote collaborations and faculty consulting with industry partners. **e)** Improve alumni database for outreach activities. **f)** Improve departmental and college websites to disseminate information/news to the community for better outreach. **g)** Encourage alumni participation in on-campus career symposia or career fairs. **h)** Conduct meetings with alumni advisory boards. **i)** Expand fundraising efforts.	• Employer data bases maintained by individual Science Departments • Spreadsheets to track student employment after graduation • Alumni Professor for a Day program • Distinguished Alumni Award program • Alumni Relations support for Department alumni events • On-campus new student recruitment events: Transfer Day; Showcase of Excellence • Log of faculty visits to local feeder schools • Spreadsheet of K-14 teachers with connections to Cal Poly Pomona Science departments • Meetings with industry stakeholders • On-campus Career Fairs and Career Symposia • Faculty involvement in internships • Grants funded by industry • Updated alumni data bases • Current events /news postings on web sites • Alumni participation in s Career Fairs and Career Symposia • Meetings with alumni stakeholders • Alumni surveys • Alumni reunions • Logs of fundraising activities