



**Sciences and Engineering
Annual Unit Plan Template
2012-2013 Academic Year**

STEP I: DESCRIBE YOUR DEPARTMENT/UNIT

a. Mission

The mission of the Science and Engineering Department is to provide the rigorous science and engineering foundation necessary for students to achieve the skills, knowledge, intellectual curiosity and scientific literacy essential for a wide range of professional, technical and academic careers. For students pursuing careers outside of science, an understanding of the processes and an appreciation for science is provided. The department mission supports the mission of the district and college by striving to provide excellent educational programs, services and opportunities for transfer and CTE students.

b. Program Applicability

The Science and Engineering Department includes the following course disciplines: Biology, Chemistry, Physical Geography, Geology, Physical Science, Engineering, and Physics. These disciplines offer courses that satisfy General Education requirements, requisites in Health Careers and Physical Education and transfer needs for Liberal Arts: Math and Science, General Science and Engineering majors.

c. Partnerships

We have an MOU with CSULB's Engineering Degree Completion Program. Five students were accepted into and four students joined the inaugural cohorts of this program in September of 2011. In conjunction with this in October 2011, we were named a sub-awardee on a STEM Collaboration grant from the Department of Education with Antelope Valley College as the lead, and CSULB as another sub-awardee. We will



get about \$12,000 for supplies and about \$50,000 for personnel.

We have had additional support from the local Engineering contractors to help offset some of our low enrolled engineering and science programs over the last several years. We also have an educational partnership with the China Lake NAWCWD which allows us access to certain types of lab equipment that would be prohibitively expensive (Mass Spectrometer for example)/

d. Distance Education

Our online offerings are geared toward completion of General Education requirements for Life and Physical Science. Generally we try to offer a Life and a Physical Science course every semester, at least one of which generally has a lab. The number of sections has been lower over the last year or so, most recently due to the dearth of online training opportunities. As a department we have had direct evidence of the importance of training for online instructors; we continue to hope a new pipeline is quickly put in place to replace the Cerro Coso Online Teaching Courses.

You could potentially get the Liberal Arts: Math and Science Degree online, but it would likely not allow you to transfer into a Science Degree at a 4-year College.

We do not teach ITV course currently in Sciences and Engineering, though they may be appropriate in the future at ESCC.

STEP 2: EXPLAIN YOUR PLANNING

a. Review of Previous Goals (of last completed academic year)

Goal: Streamline course offerings by removing courses that are not relevant to our current degrees and general education needs.
Progress: 38 classes were deleted in the Spring of 2011.



Goal: To take ownership over all degrees related to our department, remove overlap from these degrees and clarify Program Learning Outcomes.

Progress: In Spring of 2011 (and again in the Fall of 2011), Liberal Arts: Math and Science was revised, and the PLOs were written.

Additionally, Engineering was rewritten so that it is more flexible for students and will limit the number of classes they have to take that may not transfer to the varying programs at the 4 year colleges. The revisions for General Sciences were begun in Spring of 2011 and finished in Fall 2011. This was the main target for removal of overlapping and confusing emphases: Liberal Arts and Engineering were removed as they are better addressed in the other individual degrees. Earth and Atmospheric Sciences and Physics were combined into a Physical Science Emphasis, and now the degree has a much more relevant list of core courses for transfer. Finally the Human Biology Emphasis was removed, as it was deemed to be more flexibly addressed by the Liberal Arts: Math and Science Degree.

Future: The three remaining emphases in the General Sciences Degree: Biology, Chemistry and Physical Science are in pretty good shape to be transitioned in to a Transfer Model Curricula, if they become available.

Goal: Work to make the labs at KRV and SK adequate for student learning and success. The labs at KRV and SK are make-due labs at best; certainly a sink and a bit of storage is the very minimum needed for a science lab.

Progress: In preparation for teaching Survey of Anatomy and Physiology at KRV in the Fall of 2011, the following models were purchased: ½ full body muscle model, heart model, brain model, an articulated and disarticulated skeleton, eye model, reproductive/urinary system models (totaling about \$4500). We also equipped the site with a set of 15 microscopes better matched for the course level offered at this site (costing about \$7500). This site has only a very minimal set of teaching slides, to remedy this would cost another \$2500-3000. Even with these improvements, there have been complaints from the students over the last couple of terms about the limited facilities at this site. For the foreseeable future, Physical Science labs cannot be taught at South Kern due to a deficit of equipment. We did equip this site with 6 matched microscopes for the Fall 2011 Biology Labs. The facilities at SK are definitely the most below par in the College, but they will likely need to stay that way until real lab space can be dedicated to these courses.

Future: There is discussion about moving both of these locations to new facilities. As these discussions progress, science lab needs are an imperative part of the planning.

Unit Priority and Resource Needed: The astronomical observatory is a 500,000 dollar facility that has four domes and twenty optical telescopes. We need a plan and commitment from administration to maintain and keep this great facility. The entire observatory compound is fenced, relatively easy to access and located at a somewhat remote part of the IWV campus where light pollution effects are minimized. In the future, the college needs to look at replacing the parking lot lighting with shaded lamps that light only the surface of the parking lot. On one of the domes the tracts that the door rides on to open has had some damage, and the lubricating strips need to be replaced. In the storage shed there has been some damage to the wood floor, and it needs to be repaired. Several of the shelving units in the storage sheds also need to be replaced. Finally, we have a dome that is currently not in use. We need to outfit it for use.



Progress: In the budgeting for this year (11-12), M&O included the dome and storage shed repair in their budget. This is an important sign that the College has committed to the observatory. The annual Star Party is also a commitment by the College. We have enough money in our account for one large project or several smaller; we are working on determining what they should be.

b. Review of Overall Department/Unit

Program Review:

We are in mid-cycle for the program reviews for this department. General Sciences Program Review will need to be completed by Fall 2016. Engineering Program's first review will take place Fall of 2015. Liberal Arts: Math and Science is apparently Fall 2014..

SLOs:

We are about 1/3 of the way done with the SLO assessment for our classes. About half of the classes that have been assessed had all of the SLOs met to target. The remaining courses had only one (or in one case two) unmet SLOs. In general the remedy appears to be refocusing on the deficient material. We also believe strengthening the prereqs for some of these classes in writing, reading and math with improve student success. We are currently putting reading and writing prereqs in place for Biology 141/145, 251, 255, 261 and Math pre reqs in place for PHSC 111, 115. Also see attachment.

Engineering Program:

The Engineering Program is in its fourth year. During this time frame, it has been a rocky ride. The loss of the partnership with CSU Fresno has strongly negatively impacted the program. Though, student numbers had increased to classes that finished with 16-20 students, we have dropped to smaller numbers over the last several years. As we are getting back on track with our new 4-year partner, CSULB, we need to do what we can to stabilize this program. We already have good commitment from the College and the community to run the classes we put in the schedule. Except in cases where there are 0 or 1 students, we have run the Engineering classes we have scheduled over the last couple of years.

A current priority for this year is to work to get our existing classes better articulated with a wider range of 4-year schools. Shannon Bliss is working with Heather Ostash to work with our Engineering Part Time Faculty to begin this process. We are also collaborating with Math to build a Matlab class that will have broad applicability and usefulness.



GE Offerings:

As a response to the budget crisis, Science offerings have been curtailed over the last couple years. General Education offerings in the Sciences have dropped well below the needs of the students, particularly at online. As a department we have had direct evidence of the importance of training for online instructors; we hope a new pipeline is quickly put in place to replace the Cerro Coso Online Teaching Courses. We are currently working on slowly growing these offerings to balance giving students some choices in courses to take in Life and Physical Sciences while still being very conservative about our offerings. In 2012-13 ESCC Mammoth and Bishop may be able to each offer a Science class every term. KRV will continue the trend of this year of having 3 science offerings during the year, though next year, it will be 2 physical science courses rather than 2 biology. We plan to offer biology and physical science courses online every term in 2012-13.

Facilities:

Finally, nearly 2 years after moving back into our remodeled labs, we have come to the point that we are not constantly trying to resolve unfinished or improperly done work from the construction. The temperature control in the fume hood room and labs has been resolved as far as it can be. We are disappointed that we do not have the local control of this we had been promised, but we seem to have achieved a state where the temperature issues are no longer dangerous. The air flow noise in the labs may never be ideal, but several of the areas have been resolved. As stated previously the sinks in all of the laboratories are far too shallow (they are less than 6 inches). Students, faculty and staff often use these sinks to clean beakers that have held chemicals and other items. Using the sinks as they are causes a lot of splashing out of the sink and it is probable that someone will get hurt. John Daly resolved this to some extent by purchasing a set of flow regulators. We were not able to get resolve on this issue in any other way.

As stated in last year's unit plan "As a department we would like to go on record to state that we were taken out of the conversations and decision making much too early. Though we can see the advantage of streamlining the conversations once construction is started, periodic consultation could have foreseen and avoided many of the issues that have come up with bringing the labs online."

The Science Lab remodel at IWV has resulted in classrooms that are more flexible in the number of students that are served. The level of technological connectivity is the best of all classrooms at the college.

Supplies and Equipment:

As we focus on student learning and success we are finding that we have some significant equipment needs to fully utilize our new high standard facilities. As we begin our collaborative grant with AVC and CSULB, we have an opportunity to address some of these needs. Although Sciences and Engineering maintains a list of prioritized equipment needed (currently with about \$80,000 on it), it is time to build an all encompassing, forward-looking list of equipment taking all fields in science and college sites into account. We will need to judiciously plan the use the grant funds, one-time general funds and donations from our industry partners equip these teaching labs focusing on optimal



student success. The attached budget has some equipment that we know we need in a timely manner as a precursor to this process.

The course offerings in the Sciences are costly in their supply needs. Scheduling of these classes needs to correspond to the supply money to run them. The chart below estimates the semester supply costs for our classes. Several changes have been made in this chart for 2012-13. As Astronomy has stabilized over the last couple of years, the supply costs have decreased. We now estimate it costs \$500 rather than \$1000 to run a section. On the other hand, in Biology we are finding our slide collections are aging and dissection animals are costing more. Anatomy, Survey of Anatomy and Physiology, and General Biology supply costs have been raised to the next higher costing category. Note the chart also gives the projected offerings form 2012-13.

Courses	Semester Supply Cost	Projected 11-12 Offering
most Physical Science offerings	\$200	6 Physical Science
Concepts of Biology, Human Physiology, Introduction to Chemistry, Engineering I-IV, Physics I-III, Astronomy	\$500	6 Biology 2 Physiology 2 Chemistry 4 ENGR 3 Physics 4 Astronomy
, General Biology, General Inorganic Chemistry I and II, Organic Chemistry I and II	\$750	2Biology 2 Chemistry
Anatomy, Survey of Anatomy and Physiology Microbiology	\$1000	1 A&P 3 Anatomy 2 MicroBiology

Staffing:

We have been able to hire 2 new full time faculty members over the last two years. This has stabilized much of our program through the College. We are particularly finding improvement in two particular areas. With two labs, the LVN prep and GE needs, it is crucial to have a full time presence in science at ESCC. Dennis Jensen is filling this role very well. Additionally we consider the Alex Shlanta Observatory to be a jewel of our Department and the College. Scott Cameron is providing the stability needed to maintain this facility optimally for student learning and success. The hire of the Astronomy TA in the Spring of 2011 will also contribute to this greatly.

We are finding that the recent changes in HRs hiring of part time faculty is starting to affect us. We have begun the process of soliciting applications for part time faculty in Biology and Physical Science at most of the college campuses.



c. Goals for Upcoming Year (next academic year). Three goals not required. If more goals needed, copy and paste additional boxes.

Goal 1 Build a ranked, all-encompassing, forward-looking list of equipment need by the Science and Engineering Department in the next 5 years taking all disciplines and college sites into account.

1. *Connection to College Strategic Goals:* Strategic Plan 3: Seek opportunities to enhance the development and use of resources.
2. *Specific internal* or external** condition(s) the goal is a response to:* We will likely not achieve the level of equipment availability found at larger colleges, but our students' education should not suffer because they attend a small rural college. Our part time faculty and students often comment on supply and equipment deficiencies.
3. *Action Plan:* We will have focus group meetings with each scientific discipline to focus on needs over next 5 years, followed by a department meeting to prioritize among disciplines.
4. *Measure of Success:* A ranked list of equipment need by the Science and Engineering Department in the next 5 years, with a purchasing schedule and possible funding source.

Goal 2 Investigate textbook alternatives of appropriate rigor and breadth to provide an equivalent educational experience to traditional textbooks.

1. *Connection to College Strategic Goals:* Strategic Plan 1: Improve our response to community needs through customized educational opportunities, area workforce development, and quality student services.
2. *Specific internal* or external** condition(s) the goal is a response to:* As a given student fees are rising in the State of California. In recent surveys of our students in Sciences and Engineering we found that they are often spending a thousand dollars a semester on textbooks.
3. *Action Plan:* Research ebooks and renting plans to see if there are untapped resources out there that adequately address the needs of our students. Particular care must be taken to ensure that using an ebook does not adversely affect transferability of the class. This project will be headed by John Stenger Smith and Claudia Sellers. Relevant professional societies will be consulted.
4. *Measure of Success:* A plan reviewing the options. Possible student focus groups to evaluate the materials.



STEP 3: SUBSTANTIATE REQUESTED RESOURCES (Note: All items must be prioritized.)

a. New Classified Staffing. *If more lines are needed, Tab over from the bottom-right box.*

Position Title	Location	Priority: 1 = high 2 = med 3 = low	Strategic Plan goal addressed by this position	Salary Grade	Number of Months	Number of Hours per Week	Salary Amount	Funding Source: G=General Fund R=Restricted (be specific)
none								

Classified Staffing Justification. *If more than one position requested, copy and paste additional boxes.*

none

b. New Full-Time Faculty Staffing

Discipline	Affected Programs	Location	Priority	Strategic Plan goal addressed by this position	Funding Source: G=General Fund R=Restricted (be specific)
none					

Full-Time Faculty Staffing Justification:



none

c. Supplies (per unit cost less than \$1000). Enter requests on lines below. If more rows needed, Tab over from box on bottom right.

Describe resource requested	Location	Priority: 1 = high 2 = med 3 = low	Strategic Plan goal addressed by this resource	Provide a detailed rationale for the requested resource. The rationale should refer to your unit's mission and goals, recent Program Review or SLO assessment gaps, planning assumptions, and/or the College's Strategic Plan	Estimated amount of funding requested	Will this be one-time or on-going funding?	Funding Source: G=General Fund R=Restricted V = VTEA
Instructional Supplies	ESCCB	1	1 & 2	Student success in Biology	500	On-going	G
Instructional Supplies	ESCCB	1	1 & 2	Student success in Physical Science	200	On-going	G
Instructional Supplies	IWV	1	1 & 2	Student success in Biology: Micro & 2 Anatomy- \$3000, A&P- \$750, 2 Concepts, 2 General & Physiology- \$2500	7000	On-going	G
Instructional Supplies	IWV	1	1 & 2	Student success in Chemistry: 2 intro & 2 inorganic	2500	On-going	G
Instructional Supplies	IWV	1	1 & 2	Student success in Engineering: 4	2000	On-going	G
Instructional Supplies	IWV	1	1 & 2	Student success in Physical Science: 4 Astro- \$2000, 2 Physical Sci- \$400	2400	On-going	G



Describe resource requested	Location	Priority: 1 = high 2 = med 3 = low	Strategic Plan goal addressed by this resource	Provide a detailed rationale for the requested resource. The rationale should refer to your unit's mission and goals, recent Program Review or SLO assessment gaps, planning assumptions, and/or the College's Strategic Plan	Estimated amount of funding requested	Will this be one-time or on-going funding?	Funding Source: G=General Fund R=Restricted V = VTEA
Instructional Supplies	IWV	1	1 & 2	Student success in Physics: 3	1500	On-going	G
Instructional Supplies	KRV	1	1 & 2	Student success in Biology	500	On-going	G
Instructional Supplies	KRV	1	1 & 2	Student success in Physical Science- 2 Physical Sci- \$400	400	On-going	G
Instructional Supplies	ESCCM	1	1 & 2	Student success in Biology: Anatomy- &1000, Physiology & Concepts- \$1000	2000	On-going	G
Instructional Supplies	ESCCM	1	1 & 2	Student success in Physical Science	200	On-going	G
Instructional Supplies	SK	1	1 & 2	Student success in Biology	500	On-going	G
Instructional Supplies	SK	1	1 & 2	Student success in Physical Science	200	On-going	G
Laundry Service	IWV	1	1 & 2	Student success in Wash student lab coats	150	On-going	G

d. Non-Technology Equipment (per unit cost greater than \$1000). Enter requests on lines below. If more rows needed, Tab over from box on bottom right.



Describe resource requested	Location	Priority: 1 = high 2 = med 3 = low	Strategic Plan goal addressed by this resource	Provide a detailed rationale for the requested resource. The rationale should refer to your unit's mission and goals, recent Program Review or SLO assessment gaps, planning assumptions, and/or the College's Strategic Plan	Estimated amount of funding requested	Will this be one-time or on-going funding?	Funding Source: G=General Fund R=Restricted V = VTEA
Rotary Evaporator	IWV	1	1 & 2	Needed for student learning in Chemistry	8000	One time	G
Motion Detecting Devices (4)	IWV	1	1 & 2	Needed for student learning in physics	8000	One time	G
Analytical Balance	IWV	1	1 & 2	Needed for student learning in Chemistry	2500	One time	G
Hot/Cold Circulator	IWV	1	1 & 2	Needed for student learning in Chemistry	2500	One time	G
Digital Oscilloscopes (2)	IWV	1	1 & 2	Needed for student learning in physics	3000	One time	STEM grant
UV Spectrophotometer	IWV	1	1 & 2	Needed for student learning in Chemistry	8000	One time	STEM grant
Faraday's Law Experiment (2)	IWV	1	1 & 2	Needed for student learning in physics	3600	One time	STEM grant

e. Technology Equipment (computers, data projectors, document readers, etc.). Enter requests on lines below. If more rows needed, Tab over from box on bottom right.



Describe resource requested	Location	Priority: 1 = high 2 = med 3 = low	Strategic Plan goal addressed by this resource	Provide a detailed rationale for the requested resource. The rationale should refer to your unit's mission and goals, recent Program Review or SLO assessment gaps, planning assumptions, and/or the College's Strategic Plan	Estimated amount of funding requested	Will this be one-time or on-going funding?	Funding Source: G=General Fund R=Restricted V = VTEA
30 copies of Matlab	IWV	1	1 & 2	Needed for student learning and success in mathematics, physics and engineering.			

f. Facilities. Enter requests on lines below. If more rows needed, Tab over from box on bottom right.

Describe resource requested	Location	Priority: 1 = high 2 = med 3 = low	Strategic Plan goal addressed by this resource	Provide a detailed rationale for the requested resource. The rationale should refer to your unit's mission and goals, recent Program Review or SLO assessment gaps, planning assumptions, and/or the College's Strategic Plan	Estimated amount of funding requested	Will this be one-time or on-going funding?	Funding Source: G=General Fund R=Restricted V = VTEA



g. Travel (inter-campus, intra-district, conferences, etc.). Enter requests on lines below. If more rows needed, Tab over from box on bottom right.

Describe resource requested	Location	Priority: 1 = high 2 = med 3 = low	Strategic Plan goal addressed by this resource	Provide a detailed rationale for the requested resource. The rationale should refer to your unit's mission and goals, recent Program Review or SLO assessment gaps, planning assumptions, and/or the College's Strategic Plan	Estimated amount of funding requested	Will this be one-time or on-going funding?	Funding Source: G=General Fund R=Restricted V = VTEA
Course Field Trips	IWV	1	1 & 2	Necessary to support concepts in some science courses for student success	200	On-going	G
Course Field Trips	ESCCB	1	1 & 2	Necessary to support concepts in some science courses for student success	200	On-going	G
Course Field Trips	KRV	1	1 & 2	Necessary to support concepts in some science courses for student success	200	On-going	
Employee Travel	IWV	1	1 & 2	Necessary to repair or move technical equipment or supplies and maintain student success.	200	On-going	G
Employee Travel	ESCCB	1	1 & 2	Necessary to repair or move technical equipment or supplies and maintain student success.	100	On-going	G
Employee Travel	KRV	1	1 & 2	Necessary to repair or move technical equipment or supplies	100	On-going	G



Describe resource requested	Location	Priority: 1 = high 2 = med 3 = low	Strategic Plan goal addressed by this resource	Provide a detailed rationale for the requested resource. The rationale should refer to your unit's mission and goals, recent Program Review or SLO assessment gaps, planning assumptions, and/or the College's Strategic Plan	Estimated amount of funding requested	Will this be one-time or on-going funding?	Funding Source: G=General Fund R=Restricted V = VTEA
				and maintain student success.			

h. Marketing (brochures, radio spots, promotional travel, etc.). Enter requests on lines below. If more lines needed, Tab over from box on bottom right.

Describe resource requested	Location	Priority: 1 = high 2 = med 3 = low	Strategic Plan goal addressed by this resource	Provide a detailed rationale for the requested resource. The rationale should refer to your unit's mission and goals, recent Program Review or SLO assessment gaps, planning assumptions, and/or the College's Strategic Plan	Estimated amount of funding requested	Will this be one-time or on-going funding?	Funding Source: G=General Fund R=Restricted V = VTEA

i. Other (institutional fees, library books). Enter requests on lines below. If more lines needed, Tab over from box on bottom right.



Describe resource requested	Location	Priority: 1 = high 2 = med 3 = low	Strategic Plan goal addressed by this resource	Provide a detailed rationale for the requested resource. The rationale should refer to your unit's mission and goals, recent Program Review or SLO assessment gaps, planning assumptions, and/or the College's Strategic Plan	Estimated amount of funding requested	Will this be one-time or on-going funding?	Funding Source: G=General Fund R=Restricted V = VTEA

STEP 4: ATTACH PRIOR YEAR'S SLO ASSESSMENT DATA (as applicable)

STEP 5: ATTACH PRIOR YEAR'S STUDENT PERFORMANCE DATA (Instructional units only, as provided)