***Question Set: Physical Science, Math & Engineering***

**PSME Division**

1. ***Reflecting back on your equity success rates, what specific initiatives have had the most positive impact on your success rates? How is your department sharing these effective practices among full-time and part-time faculty members?***

* Effective Initiatives
  + Awareness
  + Specialized programs such as MPS and (more recently) Statway
    - Extending number of MPS sections
  + Changes in curriculum that reflect more hands on approach and a more direct faculty-student relationship
  + Some Effective Practices
    - Cohort model
      * Students
      * Faculty
    - Extended class time
    - Embedded counseling and advising
    - Embedded tutoring
    - Accelerated learning
    - Increased applications/hands on activities in curriculum
    - All instructors teach developmental level
    - Data analysis
* Sharing Effective Practices
  + Division meetings devoted to teaching
    - Encourage part-timer attendance
  + Paid retreats
  + Department meetings
    - Small departments –department culture of part-time inclusion
    - Interest groups for math
  + Seminars
  + Hiring and Tenure Committees
    - Hiring to ensure interest and skills in equity and success
    - Tenure discussions on improving student success and equity
  + Campus wide committees/communities
    - DARE, Student Success, Senate, IPBT, etc.

1. ***What do your SLO/PLO and Equity assessment results reveal about resources needed to achieve higher student success and retention rates?***

* Resources needed to achieve higher success and retention rates
  + Additional student support services
    - More tutoring, financial aid, counseling, DSS, and advising services available to students
    - More strategic application of existing student support services
    - More embedded tutors and counseling
    - More support for mps and statway
      * Recruiting and follow-up position
  + Discipline focused professional development with additional incentives for part-timers
  + Smaller sections
  + Printing support for handouts
  + Equipment and maintenance to support increased hands on curriculum
  + More time devoted to success and equity

1. ***As you look at the enrollment numbers on your departmental program review data sheets, please tell us what you have done to increase enrollment or, if your department has decreased, please tell us what your plan is for increasing enrollment this coming year?***

* During 3 year review period Division enrollment has increased 5%
* Significant shift in proportion of targeted students served
  + 23% increase in targeted group enrollments
  + 34.5% in Latino and large in others
* Effective enrollment practices
  + Natural increase in demand
  + Providing increased sections with resource limitations
    - Overcome limitations on quality faculty availability
      * Recruiting strategies
      * Hiring, mentoring, assessment
    - Overcome limitations on room resources

1. ***What is your budget planning process? How do you prioritize resource allocation within the division?***

* Focus on absolute necessities
  + Not much room for planning or dreaming
  + Printing and copying
    - Some strategies for reducing to absolute minimum
      * Individual monitored accounts
      * Require online syllabi
      * Encourage electronic distribution
      * “Assessment Only” copying policy
      * Continual discussions of reduction modes

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2013 - 2014 Academic Year** | | | | | | | |
| Div | Division | Enroll | WSCH | B Budget | Matl Fee | $Matl/Enroll | $B/WSCH |
|  |  |  |  |  |  |  |  |
| BH | Bio-Health | 16,953.00 | 80,655.81 | 98,520.00 | 16,404.00 | 0.97 | 1.22 |
| CB | Computer-Bus | 19,938.00 | 99,932.06 | 102,904.00 | 28,752.00 | 1.44 | 1.03 |
| CA | Creative Arts | 12,825.00 | 54,472.46 | 69,170.00 | 28,059.00 | 2.19 | 1.27 |
| IC | Intercultural | 11,416.00 | 50,547.94 | 18,099.00 | 20,913.00 | 1.83 | 0.36 |
| LA | Language Arts | 29,931.00 | 140,156.82 | 43,617.00 | 45,123.00 | 1.51 | 0.31 |
| PE | Physical Education | 15,317.00 | 39,969.34 | 150,984.00 | 1,178.00 | 0.08 | 3.78 |
| PSME | Phys Sci, Math, Eng | 32,287.00 | 177,189.18 | 101,325.00 | 31,779.26 | 0.98 | 0.57 |
| SS | Soc Sci & Huma | 42,547.00 | 167,859.85 | 69,531.00 | 37,581.00 | 0.88 | 0.41 |
|  |  |  |  |  |  |  |  |

* + - Printing supplement
      * Supplement calculated on anomalous base year data
        + Caused allocation to be significantly lowered
      * Copying budget is $0.98 / quarter student enrollment
      * 8 pages (white, no staple)
      * Average math quizzes and exams = 25 sheets
      * Other departments similar
      * $60K+ deficit
    - Importance of handouts to developmental students
      * Cannot be supported
* B Budget is $3/enrollment
  + - Includes all software, equipment maintenance, supplies for entire division
    - Includes all folders, pens, paper clips, note pads of instructors; scantron sheets, …
    - Includes additional pay for department schedulers
    - Includes ALL operating expenses
  + All divisions are incredibly underfunded for operational expenses
  + Absolute necessities only
* Our division
  + Chemistry
    - Though chemicals are paid through lottery, many supplies cannot be lottery funded and repair especially
    - Easily eats up ½ our budget
  + Software
  + Trying to grow engineering program

**Engineering**

1. ***Not a question but a statement. Job well done in increasing enrollment and success.***

Thank you.

1. ***0% SLO, PLO work needs to be fixed. What is the plan and when will it be done?***

In the absence of any full time faculty currently teaching in this discipline, two part-time engineering faculty have recently completed curriculum updates and initial SLO/PLO requirements and will submit them by next week. They plan to begin the assessment cycle beginning fall quarter. The faculty are receiving additional pay stipends for their work.

**Geology**

***FTEF: 2.1 for 2010-11, 2011-12, 2012-13. No Change.***

***Sections: 21 for 2010-11, 2011-12, 2012-13. No Change.***

***Productivity: Low trend.***

1. ***How are you addressing the low productivity trend considering the number of FTEF has been the same?***

* Curricular changes:
  + Created an online section of Geology 20, which will replace one of the on-campus sections (due for approval by curriculum committee)
    - Appeals to different, untapped population
    - Meteorology has been incredibly successful with a similar strategy
  + Change to single instructor lecture/lab
    - Past experience shows this mode effective in increasing enrollment
* Improved scheduling
  + Scheduled was modified while full time department member was on professional development leave, and schedule was sub-optimal in order to utilize part time instructor whose teaching availability was constrained. Original scheduling has been restored.
  + Back to back sections of identical course have been separated to reach different student

1. ***The program review data report shows significant improvement in the withdrawal rate of (sic) targeted group (19 in 2012-13 vs 36 in 2011-12). However, for targeted groups, it shows an increase (30 in 2012-13 vs 22 in 2011-12). What do you think the reason is and what do you propose to lower the numbers of withdrawals and what early prevention measures have you put in place or plan to take to reduce the number of withdrawals.***

* Possibly a question of small sample size
  + Difference in withdrawal rate of targeted group was .38 student withdrawals/class
  + Previous year had improved by almost an identical amount
  + May be background fluctuation
* Requires further investigation
  + Will check this (2013-14) year data when available to see if it is a significant trend
  + Will survey students at start of class to see if can identify factors common to those who later withdraw and try to address those issues
* Implementation of single lecture/lab instructor will provide closer student-faculty relationship – possibly reducing withdrawal rates

1. ***This is a follow up on a question from 2011-2012 program review. Has the student demand for the proposed AS-T (TMC) in Geology changed? Are there currently sufficient course offerings to match CSU lower-division requirements?***

* The demand has not changed significantly; although recent steep rises in employment opportunities in geology may drive an increase
* Offering the AS-T (TMC) would require only one additional course offering, Geology 11 (Historical Geology).
  + The course has been taught by one of the instructors in the past
  + Only one section of the course would be offered per year
    - It would not be an additional section, but a replacement for a single section of Geology 10
    - It would satisfy the AS-T (TMC) Geology requirements for those who wished to major in geology
    - It would also satisfy all GE requirements currently satisfied by Geology 10
    - It would simultaneously meet the needs of those who wished to major in geology and those who wish to complete their GE science requirements
    - It would increase enrollment slightly because interested students may take two geology classes instead of one
    - The strategy has been successfully demonstrated
      * At Foothill (Geology 10 and Geology 11)
      * At De Anza (Astronomy 4 and Astronomy 10)

**Physics**

1. ***Taking into considerations that both the number of sections and the FTEF increased over that of 2010-2011, how would you explain the drop in enrollment?***

* The drop in enrollment is likely associated with the advent of the mathematics pre-requisite enforcement.  The most apparent effect is on physics 2A and physics 10.
* There was an increase in sections of physics 50 (pre-requisite to physics 4A) due to the increased demand in the physics 4 series. This helped balance the decrease in physics 2A and 10.
* The result is also due to changing several lectures from 90 student to 60 student capacity to provide a more effective, student-center teaching environment.

1. ***In 2010-2011, all section enrollments were over 25. However, starting Fall 2011, several sections with low enrollment were offered (a couple with 10 students), what was the justifications for keeping those sections considering there were other low enrollment sections that could have absorbed those sections if cancelled? This trend seems to continue for 2013-2014.***

* We have searched all of F11, W12, and S12 and can find no sections with enrollments of 10. The lowest section enrollment (at census) found for the entire year was one instance of 16. There are several possible spurious low enrollments that may be caused by Banner peculiarities. However; even with those factors, we do not see any section enrollments that were near 10. The peculiarities of our scheduling and Banner that may cause apparent low enrollments are:
  + Physics laboratory sections are limited to 30 students due to room and equipment limitations and the critical student teacher interaction. In order to increase teaching efficiency, lectures are set at a capacity of 60 and labs at a capacity of 30. However, Banner does not allow having a single lecture (60) with two corresponding labs (2 X 30). Instead, we must create two separate sections, each listed as a capacity of 30 and each with a single lab associated with it. The lecture portion of each section is listed in the same room, on the same days, at the same time, and with the same instructor. The instructor is only paid for the single lecture. If you look closely you will see the pay code is set to no pay for the second lecture section. The instructor is paid for the two separate labs, which meet at different times. So, the example of the lowest enrollment for F11 shows that there was a section of Physics 4A.02 with an enrollment of 22. However, there was also a Physics 4A.01 with a lecture at the identical time with an enrollment of 25. The instructor was paid for a single lecture of 22 + 25 = 47 people. Hence, the actual lowest enrollment for that quarter was 47 in the lecture.
  + There are other Banner anomalies that create spurious enrollments. I noticed that in S12 there are sections listed as having enrollments of 1 and 2. However, a closer look shows that there is 0 load factor assigned to the section (meaning no pay was issued). My guess is that these were cancelled sections and that students who did not withdraw were somehow kept in the enrollment column.
  + We would be glad to review the data if there are further questions; however, I believe the low enrollments described are Banner artifacts.

1. ***The reduction of classes sizes were amid it increasing success rates, however the program review data shows a significant drop in success rates of both targeted and non-targeted groups. Would you please provide explanations as to why?***

* We are not certain of the extent of the decreasing class size (see question 2)
* The drop in both enrollment and success rates occurred predominantly during the 12-13 academic year, and may be associated with the onset of automated pre-requisite checking.
  + The sudden imposition of a calculus prerequisite for non-engineering physics may have significantly shifted the enrollments between courses, perhaps to courses that have had significantly lower success rates.
  + After the decision to require a calculus prerequisite for the Physics 2A sequence, instructors may have introduced a more mathematical approach that changed the success rates
* Determining the causes of the drops in success rate will require a deeper analysis of the data. We will investigate the details of the success rate decline to see if it is associated with particular course sequences and/or shifts in enrollment patterns between courses. It is difficult to suggest remedies until the causes are better understood. We will also look at current year data to see what if a continued pattern is emerging.
* During the time of review, the Physics department lost its only laboratory technician position. The loss of this position almost completely inhibited performing in class demonstrations, which are vital components in physics instruction. The loss of laboratory support also severely hampered lab classes as there is no one to repair and maintain vital laboratory equipment. The lab technician also played a critical part in the retention and success of our physics students and often acted as a mentor and guide to students. This may in part account for some or all of the decline in success.

1. ***The program review data report shows significant increase is withdrawals especially in the targeted group (60 in 2010-11, 57 in 2011-12, 100 in 2012-2013). What do you think the reason is and what do you propose to lower the numbers of withdrawals and what early prevention measures have you put in place or plan to take to reduce the number of withdrawals?***

* Since withdrawals are used to compute success rates, the same factors described in the previous question concerning decreasing success rates apply here.
* Again, we need to take a closer look at the data before we can formulate a plan of action.
  + We will review the past year’s data to see if there have been any more recent changes in success and withdrawals.
  + We will review the data to see if we can determine if withdrawal rates are course dependent or have other clear patterns
  + We will survey students at the beginning of the quarter to see if we can identify factors that may be characteristic of those students who choose to withdraw
* We are considering some actions that we feel might improve success and reduce withdrawals including:
  + Establishing closer ties with the tutorial center and encouraging physics students to get tutoring
  + Possibly offering a “half-speed” physics 2A and 4A course that takes two quarters to complete
* The following resources would assist in our efforts to improve student success:
  + Increased funding for tutoring – including tutors at all levels
  + Better integrated advising and counseling services
  + Restoration of the physics laboratory technician position

**Chemistry**

***Question one: “Chemistry is a bottleneck in the bio-health science pipeline…” This description is in the Dean’s Summary for 2012 and is repeated in 2013. The 2013 Dean’s summary outlined several improvements. Program Review Data is positive. Are there still wait lists for chemistry classes?***

* Yes, all chemistry classes have students on the waiting list.

***Question two: II.A.3 Chemistry, discusses Equity Gap Challenge and states that only 35% of yearly load is taught by full-time faculty. The same paragraph continues to point out that a significant portion of the department’s time is devoted to issues******related to the laboratory program. How can this be resolved?******Could Chemistry Lab “tasks”, “duties”, “responsibilities” be shared differently among the department staff?***

* Currently the department has a part-time laboratory technician who is eligible to work up to 20 hours per week. At the moment, this person is only working 12 hours per week.
* The department will supply a list of updated duties for the laboratory technician necessary for them to extend their support for the chemistry program. Once this is complete and the hours are fully utilized, there will be sufficient laboratory available to support the program during the next two years.

**Chemistry Department Five-Year Growth Plan**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Academic Year | Laboratory Staffing | Fall | Winter | Spring |
| Currently | 1+ | 30 | 30 | 30 |
| 2014-15 | 1.5 | 30 | 30 | 30 |
| 2015-16 | 1.5 | 33 | 33 | 33 |
| 2016-17 | 2 | 36 | 36 | 36 |
| 2017-18 | 2 | 39 | 39 | 39 |
| 2018-19 | 2 | 40 | 40 | 40 |

***Question three: How does Chemistry propose to re-structure Lab duties? Is there a need to change or re-assign duties related to the day-to-day operations of chemistry lab? Is there a need for training to learn proper and safe handling and disposal of harmful chemicals, substances, and hazardous waste?***

* There is definitely a need for training to learn proper and safe handling and disposal of harmful chemicals, substances, and hazardous waste. Any facility, academic or non-academic, that handles chemicals is required to train and retrain the personnel on an annual basis. Our department has never had such training. As it stands the department is non-compliant with regulations that require training of personnel who handle chemicals and this training program has to be put in place ASAP.

**Astronomy**

a*.* ***Your request for a new data projector and classroom computer seems to be a reasonable request; do you have any update as to if and when you might procure this equipment?***

* The instructor station projector and computer in the planetarium are outdated
  + The brightness of the projector is insufficient to display classroom materials
  + The projector requires a completely dark environment, which inhibits note taking
  + The computer is more than seven years old and needs refreshing
* PSME representatives met with Sharon Luciw recently and explained the situation
  + ETS said they can provide an update with a high intensity projector and computer replacement
  + Sharon estimates that the project could be completed during the summer
  + Jerry Rosenberg will work to place the job on the priority list
* In addition to the instructor station projector, the planetarium’s current twin digital cinema projection system for space simulation is approaching the end of its designed lifespan, and will have to be replaced within the next three to five years.
  + The system is critical for our astronomy classes as well as the community education program
  + The cost of a new Sony replacement system is on the order of $500,000 to $600,000
  + The cost would presumably be shared between instruction and community education

**Meteorology**

*b.* ***Your request for a piece of equipment which will be used as an increased air monitoring capability, what is the name of this equipment and how would this be used by the students as a hands-on component in your classes?***

* The Cemteks AQM-10 Air Monitoring System will measure ozone, carbon monoxide, nitrogen oxide, sulfur dioxide, lead and particulate matter which form the bulk of air pollutants.
* Chapter 14 of the current text we are using for Meteorology 10 is entitled “Air Pollution”. Daily air pollution measurements will be accessed by students to support chapter objectives.
* Sample class activities are:
  + Measuring the increase an decrease of air pollutants during “Spare the Air” days issued by the Bay Area Air Quality Management District
  + Measuring air particulates during Red Flag (High Fire Danger) Warnings issued by the National Weather Service
  + Monitoring air particulates during active wild fires in or near the Bay Area.
  + Monitoring variation of air pollutants caused by automobile traffic in Cupertino which lies at the confluence of routes 280 and 85
* The equipment could be shared with Environmental Science and Chemistry

*c.* ***You mention in your CPR that you are aggressively seeking an addition for a part-time meteorology instructor, what is the progress on this?***

* Our current part-time meteorology instructor is teaching maximum part-time load including two online courses.
* So far we have had no success in locating a second qualified part-time meteorology instructor. Meteorology is a very specialized field and teachers in other physical science disciplines don’t feel comfortable teaching meteorology or climatology. Nevertheless, we are aggressively pursuing locating and hiring an additional part-time instructor.

*d.* ***What is the progress of the installation of the AWS Weather Station, has it been installed and how has this enhanced student learning in your classes?***

* The Meteorology Department seeks install the new Weather and Air Pollution Monitoring System at the Kirsch Center for Environmental Studies.
* An appropriate site has been located and installation has been approved by the Kirsch Center Director. The installation requisition has recently completed approval process. It is anticipated that the new Weather and Air Pollution Monitoring System will be installed within the next several weeks.
* It is anticipated that data from the new Weather System will be incorporated into classes offered by the Meteorology Department and by the Kirsch Center.The system has been designed and built by Automated Weather Systems, an international company that focuses and on education in the area of atmospheric science and makes tools available that enable teachers to incorporate current weather events into the classroom. DeAnza College will be part of an international weather network and all weather data measured at DeAnza College will be instantaneously available via the internet. This weather data will be especially vital during severe weather episodes since weather affects people’s lives and in extreme circumstances can take people’s lives.