

## Fall 2012 Program Review - Annual Update by Section

As of: 5/14/2013 03:52 PM EST

### Discipline/Program/Area Name

#### Physics/Astronomy/Physical Science (PR)

[President's Office, Program Reviews, Academic Affairs (PR), Math, Science & Engineering Division (PR)]

Math, Science, and Engineering

All courses under Physics, Astronomy, Physical Science

### Academic Year

#### Physics/Astronomy/Physical Science (PR)

[President's Office, Program Reviews, Academic Affairs (PR), Math, Science & Engineering Division (PR)]

2012

### Name of person leading this review.

#### Physics/Astronomy/Physical Science (PR)

[President's Office, Program Reviews, Academic Affairs (PR), Math, Science & Engineering Division (PR)]

Alex Schroer-Physical Science

Mark McGovern-Astronomy/Physics

Joe Towe-Astronomy/Physics

Christos Valiotis

### Names of all participants in this review.

#### Physics/Astronomy/Physical Science (PR)

[President's Office, Program Reviews, Academic Affairs (PR), Math, Science & Engineering Division (PR)]

Alex Schroer

Mark McGovern

Joe Towe

Christos Valiotis

Please review the five year headcount and FTES enrollment data provided on [Program Review website](#). Comment on trends and how they affect your program.

#### Physics/Astronomy/Physical Science (PR)

[President's Office, Program Reviews, Academic Affairs (PR), Math, Science & Engineering Division (PR)]

All disciplines saw a dramatic drop (30 - 70%) in headcount and FTES over the last five years. This is primarily due to cuts in classes especially in summer and intersession. Cuts were due to decreased budgets. In astronomy, a significant drop in enrollment occurred in 2009-2010 because the discipline added a MATH 102 pre-requisite.

No changes were observed for any discipline in PT/FT enrollment data over the last five years.

Decreased enrollments and budget cuts do not allow the programs to properly develop.

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Using the student achievement data provided on the [Program Review website](#), please comment on any similarities or differences in success, retention, and persistence between race, gender, and location/method of delivery groups. Please comment on all three (success, persistence, and retention). Identify which trends and achievement gaps will be addressed in the current academic year.

#### Physics/Astronomy/Physical Science (PR)

[President's Office, Program Reviews, Academic Affairs (PR), Math, Science & Engineering Division (PR)]

Online courses in physical science were eliminated in 2008. This decision was based on the observation that a traditional lecture class had a higher rate of success and retention (89-91%) compared to the online modality (61-78%). Section counts in all disciplines saw a drastic drop over the last five years (intersession/summer cuts). Only physical science offers a summer course at the Palmdale Center and there is no data to suggest a difference in success and efficiency.

No statistically significant trends were observed in the data for the last five years in terms of gender, retention, success,

and location in all disciplines.

Some trends in ethnicity were observed but dramatic changes in data were simply due to low numbers of enrollment. Classes might have only a few students belonging to an ethnic background (Hispanic or Latino) so having a single student drop would result in a significant drop in percentages however with respect to the entire class the drop is insignificant.

Budget cuts severely limit our ability to plan and make significant changes to the programs. Instead of planning for future growth we are anticipating further cuts to classes.

**Analyze changes in student achievement and achievement gaps over the past five years. Cite examples of using data during that time as the basis for resource allocation (e.g. human, facilities/physical, technology, financial, professional development) or making other changes that resulted in improvements in student achievement.**

**Physics/Astronomy/Physical Science (PR)**

**[President's Office, Program Reviews, Academic Affairs (PR), Math, Science & Engineering Division (PR)]**

Physical Science sees many student lacking in basic skills. This is seen in assessment data for SLO 1. For the last two years SLO 1 has not been met. This SLO measures the ability of students to solve simple mathematical equations. As a result, the instructors are trying to incorporate more example and activities to improve student success in this area. Physical science has requested funding to support tutors/SI leaders at the learning center. In summer 2012, the Learning Center offered tutoring for the Palmdale physical science course. This proved to be extremely successful with one of the highest success and retention rates. As a result, we feel that funding for tutors to support physical science courses is crucial to increased success.

Physics and Astronomy also would greatly benefit from funding for tutors/SI leaders. PHYS 101 especially would benefit because there are no pre-requisites for the course and basic skills are an issue with many of the students.

Mr. Valiotis has successfully procured two Title V grants for developing STEM based courses at AVC. These have been partially used to develop conceptual based learning curricula for all course in physical sciences. As the SLO data suggest, student have benefited from courses taught using this approach. The money from these grants have also been used to improve laboratory courses at both campuses by the inclusion of better equipment and new technology.

**Provide examples from your program where assessment findings of Student Learning Outcomes (SLOs), Program Learning Outcomes (PLOs), and/or Operational Outcomes (OOs) were discussed and used to make budget decisions in the past year. This should include brief descriptions of assessment findings, when the discussions occurred, who participated, and what, if any, budget items/resources resulted.**

**Physics/Astronomy/Physical Science (PR)**

**[President's Office, Program Reviews, Academic Affairs (PR), Math, Science & Engineering Division (PR)]**

Over the last two years, physical science faculty (Mark McGovern, Alexandra Schroer, Joe Towe, Christos Valiotis, Rick Balogh) have met at both Welcome Back Meetings and at various division meetings to discuss trends in SLO findings. One direct result from these meeting was the identification of a strong need for additional funding for tutor/SI leader in all disciplines. Additionally, based on these discussions specific needs for the laboratories have identified.

Physics has asked for the purchase of new spectrometers for PHYS 211 which will be used for several laboratory activities. Astronomy would also benefit from the purchase of these spectrometers. Additionally, SLO data suggest that more modern telescopes and computer equipment can improve student success and retention.

We feel that these assessment results are valuable and accurate because assessment occur at the start and end of the each semester for each individual course taught. Result from the beginning of the course are compared to results at the end and the Hake gain is computed to properly see increases and aid in the proper development of action plans.

**Analyze changes in SLO, PLO and/or OO assessment findings over the past five years. Cite examples of using data during that time as the basis for resource allocation (e.g. human, facilities/physical, technology, financial, professional development) or making other changes that resulted in the improvement of SLO, PLO and/or OO findings this past year.**

**Physics/Astronomy/Physical Science (PR)**

**[President's Office, Program Reviews, Academic Affairs (PR), Math, Science & Engineering Division (PR)]**

In 2009, after a full time faculty member was hired for physical science SLOs were reviewed and revised. A new SLO has been developed (SLO1) that measures mathematical skills prior to taking physical science. Assessment data is suggesting that student lacked basic skills in the area of mathematics. As a result of this change, faculty are better able to address basic skills concerns in lecture.

Physics and Astronomy have both used SLO assessment results to continually revise SLO assessment tools to better reflect the way that instruction is being conducted. This has resulted in assessment data in recent years better reflecting what is being done in the classroom. Nothing in the assessment data for physics and astronomy has prompted faculty to make any changes to the SLOs themselves.

**List significant new and continuing resource needs in rank order of importance. Identify the document (e.g. Educational Master Plan, action plan, state mandate, accreditation mandate) and/or data which corroborate each need.**

**Physics/Astronomy/Physical Science (PR)**

**[President's Office, Program Reviews, Academic Affairs (PR), Math, Science & Engineering Division (PR)]**

The new Health and Sciences building that became operational in September 2012, solved all physical space needs for the Physics/Astronomy/Physical Science discipline. There are separate lab for Physics and Physical Science and the current capacity would accommodate the scheduling of at least one half more number sections. There is astronomy observation deck that greatly facilitates the deployment of telescopes for night observation although light pollution is still a problem.

The most immediate need is the equipping of the Virtual Science center with state of the art projection system so that instructors and students can take full advantage of the Virtual Science facility. Preliminary estimates bring the cost for the projector system to about \$800,000. We are currently exploring the possibility of funding the purchase through Measure R funds. In addition, the AVC Foundation is working diligently to raise private funds. The need for the projection system has been identified in the discussion about SLOs.