Comprehensive Program Review Report

Program Review - Physical Sciences

Program Summary

2021-2022

Prepared by: Quinn MacPherson

What are the strengths of your area?: The Physical Science 20 course counts as a General Education requirement and/or a science class with a laboratory component for those majors requiring it. It is a transferable course that is typically completed by students as they prepare to transfer out of COS to a four-year university. This course is open to all majors on campus ranging from Liberal arts to Science and Engineering. This course shares the Physics/Engineering budget and lab supplies. This has allowed the course to offer a laboratory component during which students learn topics such as acids and bases, 2D motion, heat capacity, buoyancy, etc. This laboratory component of the program continues to draw a positive impact on the enrollment and success of our student population.

What improvements are needed?: 1: In order to maintain a quality PSCI program it is first and foremost important that we maintain two full-time faculty members devoted to teaching physical science, physics, and astronomy. Following the retirement of Shirin Sedah, a full-time temporary position was created that is currently filled by Dr. Royster. This position should be returned to its full-time status so that there is enough faculty to cover the LHE in PSCI, PHYS, and ASTR.

2: Success rates in this course (including EW's) have been relatively stable over the past several fall semesters - 73.3% in 2017, 77.8% in 2018, 75.0% in 2019 and 72.7% in 2020. However, the success rate is likely to significantly decrease in 2021 based on the current class performance. Potential causes of this expected decrease could be due to poor attendance due to the in-person setting without participation explicitly included in the grade and potentially Covid effects such as illness and students' expectations of recorded lectures. We are therefore considering various actions to be taken to maintain or increase student success. Several of these proposals are listed below.

> Aligning the course more closely with student needs. The topics in this course need to be structured in a way that they are accessible to and interesting for students who are not majoring in a STEM field. It may be worth re-evaluating SLOs to align more closely with student needs and interests. This should be done with a focus on real-life applications. We should consider a revamp of the current course outline. Doing this will take the sustained attention of a full-time faculty member, increasing the need for the replacement full-time position.

> Develop a set of labs that are fun and interesting to increase student engagement. The labs that are currently being used are generally simplified versions of the labs given to the physics 2x and 5x series classes. We are currently working to develop a set of labs that are more engaging and less mathematically technical. Doing this will take the sustained attention of a full-time faculty member, increasing the need for the replacement full-time position.

> Improve student engagement through rewarding in-class activities/collaboration. For example, giving participation credit for in-class participation through clickers or by completion of worksheets.

> Reorder the course so as not to scare off students with the more math-intensive physics section at the beginning. The physics portion of the course could be moved later in the semester or spread throughout the semester. Additionally, the physics portion needs to be revamped to require less math, a mode of instruction that differs from the norm for teaching physics and will require additional development.

Continuing to have a full-time faculty member who teaches physical science will allow us to develop and improve the program with sustained attention from year to year.

Describe any external opportunities or challenges.:
Overall SLO Achievement: Up to date.
Changes Based on SLO Achievement: None.
Overall PLO Achievement: My understanding is that the Physical Science - AS-T program no longer exists and has been functional defunct for some time now.
Changes Based on PLO Achievement: Actually delete it in all systems.
Outcome cycle evaluation:

Action: Budget for Physical Science

Allocate a specific budget for Physical Science 20. I plan on discussing the needs of this course with our Division Chair, and the Department Dean in hopes of coming to an agreement on an adequate amount to provide equipment and supplies.

Leave Blank: Continued Action
Implementation Timeline: 2019 - 2020, 2020 - 2021
Leave Blank: 12/15/2021
Leave Blank:
Identify related course/program outcomes: District objectives #1 and #7.
Person(s) Responsible (Name and Position): Shirin Sade(instructor) ,Francisco Banuelos (Dean) , and Ryan Froese(Division Chair)
Rationale (With supporting data): There is currently no budget for this course even though there are many expenses for a course which meets for 3 hours of lecture, and 3 hours of laboratory every week. This course is a general Science course which covers Physics, Chemistry, Geology, and Astronomy.
Priority: Medium
Safety Issue: No
External Mandate: No
Safety/Mandate Explanation:

Update on Action

Updates

Update Year: 2020 - 2021 09/08/2018
Status: Continue Action Next Year
There has been some improvement regarding this action. The resources for this were provided by our area dean and our MESA program. We were able to purchase some new laboratory equipment, such as 5 additional Celestial spheres and 3 more spectrometers. This new equipment has been helping with increasing the number of groups in our lab section. This means fewer students per lab group and consequently better student access and success.
Impact on District Objectives/Unit Outcomes (Not Required): The purchase of new equipment for this course allows the instructor to develop new learning pathways for students. This could provide improved student access and success both of which are primary district and unit goals. This action needs to be on an ongoing basis since the need for renewing old equipment and or purchasing new equipment are both crucially important to teaching laboratory courses in science.

Update on Resource Allocation Effectiveness

Update on Resource Allocation Effectiveness: This program will be updating its data on SLO's this year. The effectiveness of the allocation of resources could better be analyzed once the student learning outcomes is updated. (09/17/2017)

Resources Description

Adjustment to Base Budget - $750 in above base budget allocation for instructional supplies. (Active)
Why is this resource required for this action?: There is currently an allocation of $2800 for all the physical sciences, which include Astronomy, Natural Science, Earth Science, Physics, Geology, and Geography. All of the courses have specific instructional supply, equipment, and field trip needs. $2800 is not sufficient to provide students with an adequate learning experience within each of the physical sciences.
Notes (optional):
Cost of Request (Nothing will be funded over the amount listed.):

Link Actions to District Objectives

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District Objectives: 2018-2021
District Objective 1.1 - The District will increase FTES by 1.75% over the three years
District Objective 2.1 - Increase the percentage of students who earn an associate degree or certificate (CTE and Non-CTE) by 5 percentage points over three years
District Objective 2.2 - Increase the number of students who transfer to a four-year institution by 10 percent over three years
District Objective 2.3 - By 2021, increase the percentage of students who complete transfer-level English by 15 percentage points and transfer-level math by 10 percentage point with their first year.
District Objective 3.1 - By 2021, increase the placement rates into transfer-level English and transfer-level math for targeted groups that fall below the District Average.
District Objective 3.2 - By 2021, increase the percentage of students in targeted groups who complete transfer-level English (by 10 percentage points) and transfer-level math (by 5 percentage points) within their first year
District Objective 4.1 - Increase the use of data for decision-making at the District and department/unit level
District Objective 4.2 - Improve organizational effectiveness by strengthening operations of and communication between District departments, divisions, and constituents

District Objectives: 2013-2015
2013-2015: District Objective #1 - District Objective #1 for 2013-2015: Provide effective academic support services as measured by an increase in the rate at which students successfully complete courses.
2013-2015: District Objective #7 - District Objective #7 for 2013 - 2015: Allocate resources based on an accountable and systematic District-wide planning and budget development process that links this allocation to Institutional Program Reviews and the Strategic Plan.

District Objectives: 2015-2018
District Objectives - 1.1 - Increase overall enrollment by 1.75% annually
District Objectives - 2.1 - Increase the number of students who are transfer-prepared annually.
District Objectives - 2.2 - Increase the number of students who earn an associate degree or certificate annually.
District Objectives - 2.3 - Increase course success and completion rates in pre-transfer English, Math, and English as a Second Language courses annually.
District Objectives - 2.4 - Increase Career Technical Education course success rates and program completion annually.
District Objectives - 3.1 - Reduce the achievement gap of disproportionately impacted student groups annually, as identified in the Student Equity Plan.
District Objectives - 4.1 - Improve operational systems based upon data driven decision-making as described in the COS 2.0 manuals.
District Objectives - 4.2 -Improve the efficiency, effectiveness and communication of human, physical, technological, and financial resources to advance the District Mission.

Action: (2021-2022) Maintain instructional quality and improve student success through instruction and course development by a full-time faculty member. (Replacement Faculty Member)

Hire a replacement faculty member.

Leave Blank:
Implementation Timeline: 2021 - 2022
Leave Blank:
Leave Blank:

Program Review - Physical Sciences

Identify related course/program outcomes:
Person(s) Responsible (Name and Position): Quinn MacPherson
Rationale (With supporting data): We are requesting a replacement full-time faculty member.

To continue teaching physical science without having to scramble each fall to find a physical science adjunct (something Porterville college is currently struggling with) it is necessary to maintain two full-time faculty members devoted to physics, physical science, and astronomy. This is in addition to the full-time engineering faculty position. With the retirement of Shirin Sedah - whose load is currently being maintained by a full-time temporary faculty position - a replacement full-time faculty tenured position will be needed. Having this permanent faculty position will mean that the same professor will be able to teach the course from year to year and devote time to developing and improving the course, its course outline, and its laboratory sessions.
Priority: High
Safety Issue: No
External Mandate: No
Safety/Mandate Explanation: