Comprehensive Program Review Report

Program Review - Physical Sciences

Program Summary

2020-2021

Prepared by: Shirin Sadeh, professor of Physical Science 20

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 which is typically completed by students as they prepare to transfer out of COS to a four year university. This course is now a required class for Physical Science majors at COS. Additionally, this course is open to all majors on campus ranging from Liberal arts to Science and Engineering. Enrollments in this course have traditionally been high and its success rate has been well within an acceptable range. In fact, this course showed an improvement of 13% in its success rate from 2017- 2018 to 2019- 2020 academic year. This course shares the Physics/Engineering budget and occasionally benefits from the academic grants which have lead to the improvement of this course by providing better opportunities for learning. For example, This course offers a laboratory component during which students learn how to build telescopes, explore gravitational acceleration of the Earth, speed of sound,.. etc. This laboratory component of the program continues to draw positive impact on enrollment and success of our student population.

What improvements are needed?: The Physical Science 20 course could definitely benefit from having an increase in the budget allocated to it. The topics covered in this course are not necessarily the same as those covered in Physics and Engineering courses. Designating a budget for this course will prevent it from being a burden on Physics/Engineering resources. By developing a specific budget for this course, the instructor can better plan the purchase of suitable equipment in order to address the needs of this very diverse course. I continue to work closely with our area dean and division chair to reach some common grounds on the development of a regular budget for this course. I am happy to report that we have made improvements in our capability to purchase some replacement equipment for this program. We have a total of 14 Celestial spheres instead of the 9 we had previously; We also have 3 more spectrometers at this time. This increase in instructional equipment has certainly improved the ease in delivering the Optics and Astronomy components of this course , and consequently helped with student learning and success. Improving the resources allocated to this program is ongoing as our enrollment grows.

Describe any external opportunities or challenges.: This course covers selected topics in Physics, Chemistry, Geology, and Astronomy. The overlapping topics of Physical Science 20 not only allow our students to better decide on a field of study, but also prepare them for a wide range of educational and professional opportunities. It is imperative that the instructor of this course stays current with all the new developments in the physical sciences; attending professional conferences could be of great significance in delivering the topics of this course, and consequently improving the success of our students. I have attended the AAAS annual conference in the last couple of years. The budget for this trip was provided by a local grant at COS. The conference proved to be an excellent resource for updating me on the latest developments of science. This was an enriching experience not only for me, but also for what it enabled me to bring back to the classroom.

Overall SLO Achievement: We currently have three Student Learning Outcomes planned for this course. The expected success rate was around 70%, and the results show a success rate of around 69%. There is some room for improving our SLO's and efforts are underway to address this need. We hope this goal can be met in the near future.

Changes Based on SLO Achievement: There is room for some improvement in this area. I plan on allocating more lecture and lab time to these SLO's to further improve their results. I have been utilizing the tutorial services of our MESA center to assist the students of this course. I will actively seek more resources for further development of a more direct tutorial service for this course.

Overall PLO Achievement: Our program learning outcomes continue to rate around average and better. This however will not stop our continued effort to strive to do better for our students.

Changes Based on PLO Achievement: We continue to improve our standards of teaching and learning. Recently, our MESA

program has provided this program with some tutoring. I expect to see its positive impacts on this program soon.
Outcome cycle evaluation: There is no need to modify the existing schedule for making assessments since it allows for regular monitoring of all outcomes.

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

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.