Contents

Instructional Program Review

General Information

1. Name of department (program) under review.

   Physics – AST Physics

2. Who is the person(s) submitting the Program Review form?

   Anca Husher

3. What is the current academic year (i.e., 2022-23)?

   2022-2023

4. Please describe the department/program, its staff and faculty, etc.

   Physics provides a pathway to a wide variety of high demand careers in diverse STEM sectors with the skills related to numeracy, problem solving, data analysis and communication of complex ideas, as well as understanding of how the world works on a scientific level.

   Staff: One full-time professor, and access to one instructional staff that we share with chemistry and biology. Access to one to two part-time adjuncts on demand.

5. Please describe how this department's/program's mission relates to the college's mission and strategic goals.

   Physics is a requirement for students' success in majors which require an understanding of the physical world. Students need one to three semesters of varying levels of physics to accomplish their academic goals.

   Students will master foundational skills, explore their passions, attain degrees and certificates, and pursue career and transfer pathways. Students will enhance their problem solving and critical thinking skills as they explore the relationship of physics to other topics in science, technology and engineering. Hence students will increase transfer readiness, award completion, and increase workforce readiness – specifically for careers in technical fields, insuring academic excellence and success along a journey of transformational learning and growth.

Department Data Sheet

1. Review the Department Summary Data Table. What are the strengths? What are the challenges or areas of improvement? What is the impact on students? Respond to a minimum of three trends such as census enrollment, FTES/FTEF, course success rate, course retention rate, etc.

I use Data Sheet 1 page 61-62 for Physics
Develop 3 aspects:

1) Based on the data presented in the named above datasheet, Physics overall has developed well since 2015. Retention and enrolment numbers have increased overall. I believe data is not entirely correct due to the complex mix. In any combination Physics is now a successful department that supports advanced STEM awards and transfers.
2) The AST for Physics Award is relatively new and has not consistently grown yet, due to the nature of the award. This is more challenging, as it has precise requirements for advanced STEM that not too many students at our college will pursue. Physics in general, at all UC/CSU or other academic institutions, by nature are considerably lower in numbers than most departments and award follow the same path. I will work with students and counselors to move in small increments to increase the number of students obtaining this award.
3) The average section fill rate must be discussed with our IT data staff to see how it is compounded to address the overall mix – that would be part of one of the goals below.

2. Review the Department Student Equity – Success Rates Data Table. What are the strengths? What are the challenges or areas of improvement? What is the impact on students?

Same datasheet as question # 1 above (next page – page 61 for Physics)

1) Physics is done well on dual enrollment, and we will continue to support this group of students moving forward. Also, the success rate is pretty good as well in all categories presented.
2) Based on the data the success gap rate between male and female student population can be improved to minimize any disproportions.
3) A positive impact on all students participating in any Physics programs is to maintain and continue to encourage students of all backgrounds and gender to be part of the Physics Projects (mini research) that created a great teamwork and stimulated competition, enrollment and fun too!

3. Review the Program (Department) SLO Data Table. How does your department support ISLOs? What are the strengths and challenges? What is the impact on the college mission?

Same datasheet as question # 1 above (next page – page 61 for Physics second part)
SLO data shows that in all categories the Success Rate for all categories (Communication, Critical Thinking and Knowledge) is above 90% for all demographics. Strength comes through transformational learning as physics requires a lot of critical thinking, innovation and experimental laboratories. This depicts a lot of the college's core values. One of the challenges is to maintain the STEM advancements in the laboratories as well as get a more diverse population of students.

The impact on the College mission is fulfilling all goals but especially in this case increasing transfer readiness, increase workforce readiness and maintain institutional stability.

Award Data Sheet

1. Review both tables on the Award Data Sheet. What are the strengths? What are the challenges or areas of improvement? What is the impact on students?

use Data Sheet 2 page 99 for Physics (both tables)
In the Award section of the AST for Physics is that this is still a new award that was only becoming available in 2018-2019 and students are still just learning the value of this award, especially for the Engineering degrees. The success I would measure through the fact that all students who actually completed this award got accepted fully in the engineering school of their choice. The challenges are from the student declaring step to the obtaining step, since only about half complete the award degree. This is now getting better after returning back to face-to-face classes after Covid. The impact on students is very positive as they thrive on the face-to-face course and get inspired to complete the degree. Many students return to share their stories, progress or advancements in a new advanced degree or a new job.

Course Data Sheet

1. Review the Course Summary Data Table for each course. What are the trends for enrollment, retention, and success rates? What are the strengths? What are the challenges or areas of improvement? What is the impact on students?

use Data Sheet 3 pages 484-491 (both tables). I will Elaborate in answering the question using 1 –2 courses and for each question I will pick a different course.

As Physics has a variety of courses and sections, I will focus on Conceptual Physics and Physics 5A in this question.

In Conceptual Physics (a general science course available for liberal arts students as well), based on the data there is a gap of three academic years where this was not offered due to various load reasons. However, the enrollment exploded as soon as this class was offered fully online (DE) from an average of 12 students to an average of 40 students. This class has a great potential to grow in multiple sections if I develop a free of cost for textbooks and continues to stay fully online. A drop was noted in the past year as I was out on medical leave for one semester. Challenges are to have to increase now the average fill rate back to the 87 % that was noted during Covid.

In Physics 5A (calculus based, first course of the suite ABC) the average fill rate varies between 75 – 95% from year to year. This is a course that has a very robust curriculum designed to promote student success. Mainly only students going to advanced STEM will enroll in this course. The retention rate is about 85% and the success rate about 80% as an average over several years. Not bad of advanced undergrad physics. However, the data does not match the success rate from the CSLO's - something to discuss how it is measured. The main challenge is to make sure students continue with the whole series (ABC), as some want to transfer in the middle of it and lose the award and the the equivalency during the process – as many institutions take the whole series as a whole for credit. Labs are critical for this Physics course (as for all physics courses

that have labs and have transferability) and I am still developing advanced labs and funding is an issue at times, as this equipment is not really cheap. In this class students are fully engaging in critical thinking at all times, and they go through all the transformational learning and growth. The impact on students is very positive and their great feedback is used for continuous improvement of the course.

2. Review the Student Learning Outcomes Data Table for each course. What are the strengths and challenges? What is the impact on the college mission?

use Data Sheet 3 pages 484-491 (both tables). I will Elaborate in answering the question using 1 –2 courses and for each question I will pick a different course.

As Physics has a variety of courses and sections, I will focus on Physics 4A and Physics 5B in this question.

The CSLO data for Physics 4A shows a 100% accomplishment for all present students after the census was done. This is a course with low enrollment and typically the students are very determined to complete the course well and without dropping. The challenge is to have more students taking the course as it is designed mainly for medical STEM (especially anyone that wants to pursue Physical Therapy).

The CSLO data for Physics 5B shows an average of 96% accomplishment (across all years with data presented). Data is missing, has some gaps (but SLO's were entered in the system) - most likely got dropped during the transfer of the electronic data. I guess this time the challenge is to have accurate data in hand. This will be addressed in the Goals below.

Both courses have a very positive impact on students' success and transformational learning and improvement. All are in line with the core values of our college, and I strive to a continuous improvement myself and reflected in the courses I teach. Teach 100% - nobody left out.

1. What courses and awards are due for a 5-year review? To find this information, go to the Curriculum Committee webpage and click on the following links in the left menu bar: Course 5 Year Review Tracker link and Award 5 Year Review Tracker link.

   - Courses due for review: Physics 4A.
   - No Physics Award is due for review.

Goal Setting

On the following pages, please establish goals for your department. Keep in mind the purpose of the Program Review to drive continuous improvement, as well as to help establish a need for funding or other support to achieve improved outcomes. **What sorts of things will the department be doing, or would it like to be doing, to maintain, expand, or improve excellent instructional delivery?**

This template has space to establish up to three goals. If you wish to add more goals, additional forms are available in the Teams folder.

Goal 1

1. State the status of this goal (new, in-progress, or completed):

   New & In progress - Lab Continuous Improvement

2. State this goal is one or two sentences?

   Continuous laboratory improvement to get new equipment to support student learning in this new era of sensors, and AI applications.

3. What is a short name for this goal?

   Lab Continuous Improvement

4. In what ways will achieving the goal support the college's mission and/or core values?

   Labs and hands-on activities support advanced physics for a thorough understanding and completes the academic success and transformational learning and growth of all students. These are all in line with our college core values.
   All our labs value and promote creativity, innovation, experimentation, and critical thinking.

5. List the college-wide strategic goals that will be addressed by this goal (include all that apply and remove any that do not apply).

   - Increase award completion
   - Reduce barriers to completion
   - Reduce equity gaps
   - Increase transfer readiness
   - Increase workforce readiness
   - Maintain institutional stability

6. What steps are you going to take to achieve this goal?

   Make a list with all our lab improvements, equipment or parts necessary to advance some of the labs to the next level. Also, make a list of all the broken equipment that needs to be replaced, and the wear and tear parts that need to be on going.

7. How are you going to measure completion of this goal?

   Purchasing the necessary parts/ equipment & Implementation of the labs

8. If this goal was completed or is in progress, please provide an update and summarize efforts.

   New – in progress. Some of the list of done and will be listed in the website provided for the Program review.

9. Briefly describe or list the types of resources (staffing, equipment, technology, facilities, etc.) that are needed to support and achieve this goal. Then enter all resource requests through the Resource Allocation Requests link below.

   Equipment/ technology applicable in the lab.

Resource Allocation Requests

- Enter requests in the Program Review Resource Allocations Request From (Secured – YCCD Login Required) located on the Program Review webpage under the Resource Allocation Requests heading.

Goal 2

1. State the status of this goal (new, in-progress, or completed):

   New

2. State this goal is one or two sentences?

   Create a new Conceptual Physics design course for DE (fully online) with ZCT – zero cost textbook for students.

3. What is a short name for this goal?

   CP1 online ZCT

4. In what ways will achieving the goal support the college's mission and/or core values?

   Academic Excellence & Success via a robust curriculum and continuous improvement through the assessment of student learning outcomes, program effectiveness, and our decision-making processes.

5. List the college-wide strategic goals that will be addressed by this goal (include all that apply and remove any that do not apply).

   - Reduce barriers to completion
   - Reduce equity gaps
   - Increase transfer readiness
   - Increase workforce readiness
   - Maintain institutional stability

6. What steps are you going to take to achieve this goal?

   Design a new course for DE (full online) with no cost for textbooks.

7. How are you going to measure completion of this goal?

   Completion and implementation of the course.

8. If this goal was completed or is in progress, please provide an update and summarize efforts.

   New – looking for the right online materials right now.

9. Briefly describe or list the types of resources (staffing, equipment, technology, facilities, etc.) that are needed to support and achieve this goal. Then enter all resource requests through the Resource Allocation Requests link below.

   Personal time to develop the course and funding for ZCT to be available to print or available to rent in the library.

Resource Allocation Requests

- Enter requests in the Program Review Resource Allocations Request From (Secured – YCCD Login Required) located on the Program Review webpage under the Resource Allocation Requests heading.

Goal 3

1. State the status of this goal (new, in-progress, or completed):

   New

2. State this goal is one or two sentences?

   Review and discuss Physics Dept data with our Research Analyst (Matthew Connot)

3. What is a short name for this goal?

   Data collection and dissemination

4. In what ways will achieving the goal support the college's mission and/or core values?

   This goal supports completely our *Assessment and Improvement* core value: continuous improvement through the assessment of student learning outcomes, program effectiveness, and our decision-making processes. We use the results of these assessments to pursue improvements in our courses, programs, practices, and student outcomes.

5. List the college-wide strategic goals that will be addressed by this goal (include all that apply and remove any that do not apply).

   - Reduce equity gaps
   - Maintain institutional stability

6. What steps are you going to take to achieve this goal?

   Set up several meetings with our Research Analyst (Matthew Connot)
   Pull data set out and analyze them

7. How are you going to measure completion of this goal?

   Data restructure and agreement as how to collect it and distribute it to be as correct as possible.

8. If this goal was completed or is in progress, please provide an update and summarize efforts.

   New

9. Briefly describe or list the types of resources (staffing, equipment, technology, facilities, etc.) that are needed to support and achieve this goal. Then enter all resource requests through the Resource Allocation Requests link below.

   Flex time with the research analyst.

Resource Allocation Requests

- Enter requests in the Program Review Resource Allocations Request From (Secured – YCCD Login Required) located on the Program Review webpage under the Resource Allocation Requests heading.

Submit

- When you have completed all areas of the Program Review as outlined above, notify your dean by typing the @ symbol and your dean's name in the box below (e.g. @Sean Osborn, @Steve Amador, etc.).

@Sean Osborn
@Jeri Pourchot

Dean's Review and Feedback

Deans: Please review the form above and place any thoughts or feedback that you have in the space below. Feedback from AAC, counseling, industry, etc. can be included. When completed, please put the @ symbol and the faculty member name(s) at the end so that they will get notified when your review is completed.

The Dean's office is fully supportive of developing a fully online, ZTC, Physics course. This would open opportunities for students who otherwise could not come to campus. Any new equipment requests should go through the IELM process in Fall 23. I will relay this information to the instructor.