

Program Review – Annual Program/Discipline Update
Administrative Response and Follow Up
Winter 2021-2022

Program/Discipline: Physics

SAC Chair(s): **Darrell Lim**

SAC Administrative Liaison (Director or Program Dean): **Ken Friedrich** (outgoing interim 2021-2022) & **Matt Glazewski** (incoming interim 2022-2023)

Other Dean(s) or Director(s):

Department Chair(s): **Tony Zable, Vicki Schroeder, Mike Mackel, Jim Schneider**

Date: **17 March 2022**

**This section is for Administration to provide feedback.
To be prepared by Program Dean(s) and reviewed by Pathway Dean and AVPs.**

Because this response comes to you during a transitional period, this response is a collaboration between Dr. Kenneth Friedrich (outgoing Interim Temporary Program Dean for Sciences), Matt Glazewski (incoming Interim Program Dean for Physical Sciences), and Dr. Alyson Lighthart (Pathway Dean for Sciences, Computing, and Engineering). First and foremost your deans who support physics would like to acknowledge the time and effort that went into preparing this Annual Discipline Update (ADU) for PCC, which occurred on top of your primary / priority work of supporting your students through year 2 of a global pandemic.

Also, we agree that it would be very useful to have **pathway level and whole college level data available to you all for comparison purposes in the coming ADU cycle**, and are upvoting that here at the top of our response.

1. Strengths and successes of the program as evidenced by the data, analysis and reflection:

The faculty publication rate within your SAC is always astonishing. The direct support you offer for students outside the classroom, as with the EXITO program and the Oregon Space Grant, are commendable.

It is clear from your analysis that the physics courses are tracking with the other sciences in growing as a proportion of the classes that are successfully run at PCC, despite overall enrollment declines at PCC. We support your plan to continue to offer students online lecture

even as the labs come back to campuses. This honors the students demand for increased flexibility, while also honoring the very real need for science labs to be hands-on and interactive. We also saw in SAC emails that you may consider the 201-series physics for online lab development as well. It makes sense that the 100-level physics students need more hands-on support, and the 211-level courses are too intricate to keep completely online. Maybe 201-physics is *just right*. In any case we encourage you to continue to explore the possibilities—the world has changed, and we need to figure out how to adapt to that so that we can best meet the changing needs of our students.

It is clear from looking at your success rates in the sequence courses that more students that make it into the second course succeed than succeeded in the first course. We get that there is bias in who is taking the second and third courses in the sequence (that is to say, the students who succeeded in the first one!). But we would ask you to explore what else might go into the higher success rates in those classes? Have students developed relationships with each other or with their instructor that bolster their success? Do they have different study habits? Are you somehow teaching these advanced sections differently, or covering fewer topics maybe?

2. Areas of challenge or concern, if any:

We hear you that a major source of concern for Physics faculty has been academic integrity and homework sharing sites such as Chegg and QuizLet. We recognize that there can be no single solution to this problem. The Physics SAC is encouraged to engage with faculty peers, with the TLC, and with our Online Learning office to continue exploring assessment options that may look very different from those historically used to assess student learning. Assessments that are contextualized are less susceptible to Chegg or similar platforms and, in addition, these can engage students who may not easily identify as STEM students.

Your incoming program dean is committed to making inquiries to PCC's legal team to see if there are larger efforts that we can leverage in discussions with these private sector entities. Similarly, your new dean will reach out to other institutions that are battling this problem to determine if another course of action could be fruitful. Similarly, your new dean will reach out to other institutions that are battling this problem to determine if another course of action could be fruitful. In the meantime, please as always email your concerns about specific students to conductandcare@pcc.edu. And, now that the campuses are open again, you may begin to work with your FDC and Program Dean to move at least your exams to a proctored on-campus format.

The two primary areas of concern that jump out to us in your data are the lower participation rates of female-identified students in the PHY 101 and PHY 211 series, and the lower success rates of BIPOC students in all your courses. We have had the opportunity to dive into the demographic of all the science courses through these ADUs, and we can tell you that not all the lab science PCC courses see the same demographic gap, though you're pulling similar students from the same PCC pool. We know that many of our students are one flat tire away from going

sideways in their courses. We also know that the more sense of belonging they have in their classes, the more likely they are to fight through the obstacles and succeed. We encourage every member of the Physics SAC to take the professional development that PCC offers in culturally responsive teaching and in building a sense of community in your classes, and to apply what you learn to all your classes.

Late in Winter term you were offered the opportunity to join a science-only cohort of professional development training around equity and inclusion. The goal of this training is to build a foundation to enhance our collective understanding of racial equity, in order to better understand and respond to racially-charged situations. If you are able to join this cohort, you will work with an excellent trainer to:

- build a glossary of shared terms (something which I've recently come to discover we really do not have yet in the sciences, even when (or perhaps especially if) we think we do);
- understand implicit bias, structural racism, and microaggressions;
- understand our own power, privilege, and identity by looking at our place in the world through a variety of lenses; and
- understand oppression, and how it impacts us all.

We are particularly excited about that first goal of building a common language across the college and within our pathway. We hope that as all our faculty come together in understanding these concerns, we can also come together in making our classrooms a safer space for our students.

If you are not able to join this cohort, please seek out other professional development around belonging, justice, equity, diversity, and inclusion, or watch your email for opportunities forwarded by your deans. Consider also reading [this short article](#) from the Chronicle of Higher Education about alternative approaches to high stakes testing (that coincidentally are plagiarism-proof!). Or check out [How Humans Learn](#), by Joshua R. Eyler, which has a number of excellent science-related examples scattered throughout the text.

Increasing belonging may have a positive impact on the success rate for your students of color, which are remarkably lower than for white students. Consider reaching out to the ESR SAC about ways to encourage student success across all demographics. While there are fundamental differences in the sciences you teach, these are still lab sciences, and something appears to be working for them. Cross-communication can help you think outside the box and bring in new ideas for closing the gaps.

Perhaps also before each SAC meeting you could collect from everyone their best thinking around any given subject (e.g. building belonging in the classroom, or [racial equity](#) and [social justice](#), or [grading for equity](#)...?), that could be collected on a single document to share at the beginning of each SAC. Keeping B'JEDI (belonging, justice, equity, diversity, and inclusion) work at the center of your work will help keep it at the forefront of your reactions in the classroom, and will slowly help move the numbers in these annual updates.

3. Reflection on goals and resources:

The following list of positive outcomes that came as a result of going remote is copy/pasted from your ADU, because it is a compelling list of things for you to keep doing by way of support for your students:

- *Widespread pre-recording topic videos for students*
- *Widespread video recording of class sessions for students to review later*
- *Improved and increased use of video technology for student communication with their class peers*
- *Increased student accessibility to instructor office hours and study sessions with peers through communication platforms such as Zoom, Discord, Google Meet, etc.*
- *Improved accessibility to classes due to greater flexibility in class scheduling, including decreased commuting and travel time between campuses*
- *Ability to upload actual instructor notes written during class sessions for student access*
- *Expanded use of effective technology to support student learning*

Likewise, we hope you will work on these as well (also copied directly from the ADU):

- *Continue to refine remote physics courses for future terms so we can be confident that student learning in remote physics courses is comparable to in-person classes.*
- *Establish a process and mechanism for scheduling on-campus exams for remote physics courses*
- *Develop ways to leverage the student usage of “cheater” websites, such as Chegg, in positive ways to improve the student learning experience and increase student learning outcomes.*
- *Identify and/or develop effective online physics labs that can be comparable to on-campus equivalents.*

Please also lean into the One College model in your scheduling of PHY courses. We see that SY continues to teach the largest fraction of physics across the college. While that may be associated with ENGR courses being also SY-based, we would like you to examine the data to see whether that's where the actual demand is. The new Ad Astra program should provide some of the valuable insight that you mentioned wanting, with regard to when and where students need which classes. It may also show you how enrollments change over the course of the academic year. If it doesn't, please ask your IAA if they can find that information for you.

Since we're on the topic of One College, please know that we continue to hold the goal of getting the campuses to parity in their resources. To that end, we would like to share with you this [spreadsheet](#) to collect your ideas to better support PHY across all 4 campuses, and help

get us to truly be One College. Please as you have that conversation consider also that we have centers at Newberg and Hillsboro that would love to take on science classes. Are there PHY lab classes that are *not* materials intensive that might work there? Or could there be a portable set of lab supplies that could be moved from place to place? Does anyone in your SAC live near those centers, such that it wouldn't be a huge thing to ask you to teach there?

The coming years will be a time of reconsidering what we have done in the light of what we ought to do to best serve our students. As we are able to hire new faculty for the college, we want to ensure we are doing so in a way that best serves all our students.

4. Recommended next steps:

_ * _ Proceed as planned on program review schedule**

_ * _ Follow up conversation needed with SAC, Dept Chair(s) and Dean**

Follow-up conversations are needed in order to bring many of your recommendations into reality. These conversations should include at least the Interim Program Dean for Physical Sciences and the Pathway Dean for Sciences, Computing, and Engineering.

5. Additional comments/questions:

We want to thank all contributing members of the Physics SAC for your continued hard work in support of PCC students. We know these past two years have not been easy, and you have done great work in supporting your students and each other. Please always feel free to reach out to your Pathway or Program Dean for assistance as needed, as we begin our long-awaited transition back to campuses.