Physics Program Review

Rubric Evaluation	Kathy Armstrong (Same Division Faculty)	Harmony Folse (Faculty At-Large)	Al Guzman (Staff At-Large)	Ram Subramaniam (Administrator)
A. Program Information				
Program Mission Statement				
How many criteria are met for the Program Mission statement?	Exceeds expectations for all 8 criteria - Excellent	Addresses 4 to 7 of the criteria - Needs Some Improvement to Meet the Standard	Addresses all 8 criteria - Meets the Standard	Addresses all 8 criteria - Meets the Standard
Reader Feedback	This is an excellent mission statement. i think perhaps there is a typo in "STEMM" (?) Also it does not indicate the activities of the program beyond stating lecture and lab but that is probably appropriate in this context.	Overall, I think the program mission statement is clear and showcases the department well. My only critique is that the statement mentions lectures and labs but it would be beneficial to include a brief mention of what types of activities are completed through lecture and lab (are models used? hands-on experiments? active learning activities in lecture? etc) to give those interested in the program a better idea of what one can expect from classes in the Physics department. Or alternatively, this statement: "To support the college mission, we develop students' analytical reasoning,	The statement is good because it identifies the stakeholders as well as the primary function of the program. In my opinion, the statement is not distinctive to give it an excellent rating. I guess I was looking for the statement to say something like "The mission of the Foothill College Physics Department is to provide ..." I have heard great things about the Physics Department at Foothill in my over 30 years here, and I so respect the quality of instructors. I guess I wanted the statement to have a little more color, passion, fullness like the following: (I am stealing this from page 18 of UCF	N/A

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		collaborative learning, and critical thinking skills to help become informed global citizens and achieve their future goals." could be edited to include the types of activities that are used to develop students' reasoning, learning and critical thinking.	Academic Program Assessment Handbook) "The program promotes a commitment to continued scholarship and service among graduates and will foster a spirit of innovation." Maybe the word limit in the format of the program review prevented including too many words?	
Program Learning Outcomes				
Overall, this section:	Addresses 3 to 4 of the criteria - Needs Some Improvement to Meet the Standard	Addresses 3 to 4 of the criteria - Needs Some Improvement to Meet the Standard	Addresses all 5 criteria - Meets the Standard	Exceeds expectations for all 5 criteria - Excellent
Reader Feedback	These PLOs are excellent although the first (students will be able to solve word problems in physics) is very broad and could be written in such a way as to suggest that the outcome will be met through a gradual building toward higher level thinking. The other two PLOs (Writing lab reports and demonstrating skill with lower-level lab skill) are far	Overall, the PLOs are short but address most of the criteria well and are very student-centered which is great. My feedback for this part is related to the measurable learning outcomes. For measurable learning outcomes criteria: "properly manipulating basic mathematical formulae to arrive at the correct answers." This	Succinct, covers essential elements, understandable.	N/A

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	more narrow in scope and do not necessarily require scaffolding or higher order thinking. Lab skills do not necessarily require higher order thinking so perhaps this PLO could be expanded to include something about experimental design(?)	seems a bit vague, what would be considered a correct answer and how can having the ability to arrive at the correct answer be measured outside of the classroom/in a job setting/transferring to a university/etc? Maybe it could be reworded into something like "students will demonstrate the ability to properly manipulate mathematical formulae and apply the laws of physics to solve theoretical word problems" ? "Upon completion of the AS degree, students will demonstrate the ability to effectively communicate physics by crafting written lab reports and/or giving oral presentations." What does it mean to communicate physics? What is being communicated about physics? This could be expanded upon.		

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B. FTES - Enrollment Trends				
1. What does the FTES data trend indicate?	FTES has not changed or has decreased over the time span no more than 1% to 10% - Meets the Standard	FTES has not changed or has decreased over the time span no more than 1% to 10% - Meets the Standard	FTES has not changed or has decreased over the time span no more than 1% to 10% - Meets the Standard	FTES has not changed or has decreased over the time span no more than 1% to 10% - Meets the Standard
FTES Narrative Explanation - ***Discuss the factors that would help the college understand these trends and whether there are tangible reasons for no change/flat, an increase or decrease in the trend.***				
Overall, in this section:	The narrative includes fewer than 3 of the criteria - Needs Major Improvement to Meet the Standard	The narrative includes all 4 of the criteria - Meets the Standard	The narrative includes all 4 of the criteria - Meets the Standard	The narrative includes all 4 of the criteria - Meets the Standard
FTES Action Narrative (if applicable) - ***Describe the proposed actions for stabilizing/increasing the FTES.***				
Overall, in this section:	The narrative is not included	The narrative includes all 5 of the criteria - Meets the Standard	The narrative is not included	The narrative includes all 5 of the criteria - Meets the Standard
Reader Feedback	FTES meets the standard and so Action statements are not required	The FTES has decreased by a very small amount over time which is good. It is mentioned that the numbers recovered due to larger class size through distance-education in the pandemic. How will this change if the physics department returns to in-person learning? Will these	This time frame covers shelter-in-place due to Covid. Not only was this department affected, but our entire college and district. I commend the Physics Department for persevering with larger classes sizes even though they lost a full-time instructor.	N/A

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		higher class sizes be maintained as the department transitions back to on-campus or does the physics department expect to continue to offer online sections to maintain higher class sizes? It could be important to address this in the narrative to show that there is an action plan in place to either maintain larger class sizes through online sections or through increases to in-person sections.		
C. Sections - Enrollment Trends				
Section Narrative Explanation (If Applicable) - *Explain why the number of sections is flat, increased or decreased.*				
Overall, in this section:	The narrative exceeds expectations - the narrative could be used as an exemplar - Excellent	The narrative exceeds expectations - the narrative could be used as an exemplar – Excellent	The narrative includes all 4 of the criteria - Meets the Standard	The narrative includes all 4 of the criteria - Meets the Standard
Section Narrative Explanation (If Applicable) - *Explain why the number of sections increased while FTES decreased.*				
Overall, in this section:		The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes all 3 of the criteria - Meets the Standard
Reader Feedback	N/A	Not applicable.	Explanation is minimal but adequate. Most of the	N/A

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			focus is outside of department control where the opportunity to describe department efforts to increase enrollment, such as Physics Show, could have been mentioned (again and again).	
D. Productivity - Enrollment Trends				
1. What does the data indicate about the productivity trend?	The program productivity trend has increased or has reached its maximum - Excellent	The program productivity trend has increased or has reached its maximum – Excellent	The program productivity trend has increased or has reached its maximum - Excellent	The program productivity trend has increased or has reached its maximum - Excellent
Productivity Narrative Explanation (If Applicable) - *Explain why the productivity is flat, increased or decreased.*				
Overall, in this section:	The narrative exceeds expectations – the narrative could be used as an exemplar – Excellent	The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes all 3 of the criteria - Meets the Standard	
Productivity Action Narrative (If Applicable) - *Describe the proposed actions for stabilizing/increasing the productivity number.*				
Overall, in this section:	The narrative is not included	The narrative includes all 5 of the criteria - Meets the Standard	The narrative includes all 5 of the criteria - Meets the Standard	
Reader Feedback	Narrative not needed because productivity has increased	The increase in productivity is quite high, which is great, but it is also mentioned that this has	Despite the difficulties faced by the Physics Department, they did a	Not applicable as productivity is increasing.

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		been achieved through non-sustainable means and proposes an alternative that is addressed later on. The department has proposed to eliminate double-lab lectures and decrease the amount of students in one lecture so that students can receive more attention and new pedagogical strategies can be implemented. This seems like a measurable solution for the problem.	great job increasing productivity numbers.	
E. Enrollment by Student Demographics				
a. Enrollment by Gender				
Enrollment by Gender Narrative Explanation - *Explain why the enrollment rates is flat, increased or decrease for male, female, or non-binary.*				
Overall, in this section:	The narrative exceeds expectations – the narrative could be used as an exemplar - Excellent	The narrative includes all 3 of the criteria - Meets the Standard	The narrative exceeds expectations – the narrative could be used as an exemplar - Excellent	The narrative includes all 3 of the criteria - Meets the Standard
2. Does your program differ in the percentage of males to females, in this most recent year, compared to the College?	The difference between the gender/sex is between 11% to 20% - Meets the Standard	The difference between the gender/sex is greater than 30% - Needs Major Improvement to Meet the Standard	The difference between the gender/sex is between 21% to 30% - Needs Some Improvement to Meet the Standard	The difference between the gender/sex is between 21% to 30% - Needs Some Improvement to Meet the Standard

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(College 2020-21 = 52%Female, 46% Male)				
Enrollment by Gender Action Narrative (If Applicable) - ***What is the source of gender disparity and what proposed/planned actions is the program taking to achieve parity?***				
Overall, in this section:	The narrative includes 4 of the criteria - Needs Some Improvement to Meet the Standard	The narrative includes all 5 of the criteria - Meets the Standard	The narrative exceeds expectations – the narrative could be used as an exemplar – Excellent	The narrative includes all 5 of the criteria - Meets the Standard
3. What does the data trend indicate about enrollment (headcount) by gender of declared majors in the program?	The Gender gap by declared major is greater than 30% - Needs Major Improvement to Meet the Standard	The Gender gap by declared major is greater than 30% - Needs Major Improvement to Meet the Standard	The Gender gap by declared major is greater than 30% - Needs Major Improvement to Meet the Standard	The Gender gap by declared major is between 21% and 30% - Needs Some Improvement to Meet the Standard
Reader Feedback	As mentioned in narrative for Enrollment by Gender, the number of female-identifying physics majors with baccalaureate degrees nationally is less than 25%. Foothill demographics show 27% of physics majors identify as female. This reveals a trend that will require time and strong shifts in cultural trends to repair. Foothill Physics department is mindful of this disparity and is taking some action to address it.	Although I had to select "Needs major improvement to meet the standard" because the gender gap was greater than 30%, I do not feel this is under control of the department nor a fault of the department, as this matches national trends for physics majors. I don't think this needs major improvement to meet the standard as the department already seems to be making efforts to decrease the gender gap	Although the gender gap by declared is greater than 30%, the Physics Department does a great job of trying to attract all students and strives to do better. The national average for females declaring Physics is less than 25%, Foothill a little better at 27%. The Physics Department recognizes that there is a great gender disparity and has taken efforts to make classes more welcoming to women. As the writer of	N/A

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		as well, which has shown an increase in enrollment of female students.	this report mentions, efforts include highlighting contributions of women, being open about discussion of gender inequity, and minimizing problems in homework regarding sports or military. Finally, the department focuses on hiring women for the Physics Show to help disrupt harmful stereotypes. This is all very commendable.	
b. Enrollment by Ethnicity				
Does your program differ in enrollment distribution among ethnic groups, in this most recent year, compared to the College enrollment by ethnic group? **(College 2020-21 = 5% African American, 28% Asian, 5% Filipinx, 28% Latinx, 1% Native American, 1% Pacific Islander, 29% White, 4%Decline to State)**	The enrollment does not mirror the college's ethnic distribution - Needs Some Improvement to Meet the Standard	The enrollment does not mirror the college's ethnic distribution - Needs Some Improvement to Meet the Standard	The enrollment does not mirror the college's ethnic distribution - Needs Some Improvement to Meet the Standard	The enrollment does not mirror the college's ethnic distribution - Needs Some Improvement to Meet the Standard

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Enrollment by Ethnicity Narrative Explanation (If Applicable) - ***Explain changes identified over the past five years for each ethnic group (address each ethnic group by bullet point).***				
Overall, in this section:	The narrative exceeds expectations – the narrative could be used as an exemplar - Excellent	The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes all 3 of the criteria - Meets the Standard
Enrollment by Ethnicity Action Narrative (If Applicable) - ***Describe the proposed actions for addressing disparities in enrollment by ethnic group within the program.***				
Overall, in this section:	The narrative includes 4 of the criteria - Needs Some Improvement to Meet the Standard	The narrative includes all 5 of the criteria - Meets the Standard	The narrative includes all 5 of the criteria - Meets the Standard	The narrative includes all 5 of the criteria - Meets the Standard
Reader Feedback	Physics has disparities from college enrollment in most categories (except where the numbers are very low). White and Latina/Latino enrollment is lower than college average, while Asian enrollment is significantly higher. The action proposed in the narrative (ie taking a blended lecture-lab approach with an accompanying smaller class size) promises to encourage engagement and community building across all groups.	As mentioned previously, I like the proposed method of decreasing lecture sizes. Is there something else that can be done to market the physics department to African-American and Latinx students? Maybe students of these demographics in the college could take a survey and share why they may or may not be interested in physics?	Again, I think the Physics department is doing all it can to equitably appeal to all ethnicities. Also the idea of eliminating double-lab lectures can be a step in allowing students to feel more included and a step in community building. The Physics department is focusing on moving away from large lectures to allow for better community building. The department also encourages focusing on students who have been underserved by our	N/A

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	Published studies on the effect of small class size in STEM disciplines suggest that small class size alone is likely less important in closing the achievement gap than is the increased active learning that would accompany a shift to the proposed blended lecture-lab classroom. Taken together (ie a smaller class size combined with the increase in active learning in a blended lecture-lab), the Physics department would greatly enhance its ability to support students in ways that have been proven to improve the success rates of targeted disadvantaged groups.		educational system. It is important to recognize and commend efforts to narrowing the achievement gap.	
F. Student Course Success				
a. Student Course Success				
1. What does the data trend indicate about overall course success?	Course success has improved over the time span - Excellent	Course success has improved over the time span - Excellent	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard	Course success has improved over the time span - Excellent

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Student Course Success Narrative Explanation - ***If the data trend shows an increase, decrease, or no change in students' course success percentage, explain what programmatic factors led to such a trend.***				
Overall, in this section:	The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes all 3 of the criteria - Meets the Standard	The narrative exceeds expectations – the narrative could be used as an exemplar - Excellent	The narrative includes all 3 of the criteria - Meets the Standard
Student Course Success Action Narrative (If Applicable) - ***Describe the proposed actions for stabilizing/increasing the student's course success percentages.***				
Overall, in this section:	The narrative includes all 5 of the criteria - Meets the Standard	The narrative includes 4 of the criteria - Needs Some Improvement to Meet the Standard	The narrative includes all 5 of the criteria - Meets the Standard	The narrative includes all 5 of the criteria - Meets the Standard
Reader Feedback		The elimination of double-lab lectures is mentioned again which is good, as it shows the physics department is serious about implementing this change. It is also mentioned that the calculus/math sequence in this major is really long and if students don't pass, it extends their time at Foothill. Has there been any communication between the physics and (presumably) math department on what can be done to mitigate this?	So much of the success of the Physics department also depends on the success of other subjects like math, chemistry, engineering, biology, and computer science. For example, if you wanted a degree in physics, you need to begin by taking English 1A, Calculus 1A, Chemistry 25, and Physics 2A. Fail in one of these other areas, you lose a student. In my experience, this type of study is only attempted by very accomplished students,	N/A

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			mostly English as a first language or very competent in English. With this type of academic demand, or expectation, it is no wonder that success rates are as high as they are.	
b. Student Course Success by Student Groups				
3. Is there a course success gap between African-American, Latinx, Filipinx student groups and Asian, Native American, Pacific Islander, White, Decline to State student groups?	The gap between the two groups has increased over the time span - Needs Major Improvement to Meet the Standard	The gap between the two groups has increased over the time span - Needs Major Improvement to Meet the Standard	The gap between the two groups has not changed over the time span - Needs Some Improvement to Meet the Standard	The gap between the two groups has not changed over the time span - Needs Some Improvement to Meet the Standard
Course Success by Student Groups Narrative Explanation - *Explain why the course success gap is flat, increased or decreased.*				
Overall, in this section:	The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes 2 of the criteria - Needs Some Improvement to Meet the Standard	The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes all 3 of the criteria - Meets the Standard
Course Success by Student Groups Action Narrative (If Applicable) - *What actions are program faculty and staff engaged in to decrease the course success gap between African-American, Latinx, and Filipinx student groups and Asian, Native American, Pacific Islander, White, and Decline to State student groups?*				
Overall, in this section:	The narrative includes 4 of the criteria - Needs Some Improvement to Meet the Standard	The narrative includes all 5 of the criteria - Meets the Standard	The narrative includes all 5 of the criteria - Meets the Standard	The narrative includes all 5 of the criteria - Meets the Standard

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Reader Feedback	Data is divided on the value of small class size in narrowing the achievement gap in STEM so eliminating the double-lab lecture does not alone promise improvement. However, the Physics department's desire to integrate lab with lecture and their continual attention to active learning pedagogy does support taking such a bold action.	My one comment is that I noticed course success for African-American, Latinx and Filipinx has stayed the same over the 5 year period but it looks like the amount of students who withdrew actually slightly increased over the 5 year period. I did not see this increase addressed in the narrative. Can specific issues other than the large lecture sizes be identified as a reason for why these groups are leaving the program at an increased rate?	As the author of this report mentions, Physics is a White and Asian mail dominated field, and I agree. I believe this is especially true during the Covid shelter-in-place that required virtual instruction. For ideal virtual instruction, access to the best and latest equipment is ideal. Also, consistent suitable environments of study is also ideal. Many underserved populations do not have access to the best equipment or the best consistent connections of internet service. Also, to have necessary environments for study - such as a quiet, undisturbed space -is usually lacking. These are elements outside of control our Physics department, but they are still aware of the	N/A

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			disparities and do their best to address.	
G. Student Course Success by Demographics				
a. Student Course Success by Gender				
What does the data indicate about course success?				
Female	Course success has improved over the time span - Excellent	Course success has improved over the time span – Excellent	Course success has improved over the time span - Excellent	Course success has improved over the time span - Excellent
Male	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard
Non-binary	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard	
Course Success by Gender Narrative Explanation - ***If the data trend shows an increase, decrease, or no change/flat in the male, female, or non-binary student course success percentages, explain why the percentage is flat, increased or decreased.***				
Overall, in this section:	The narrative exceeds expectations - the narrative could be used as an exemplar – Excellent	The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes all 3 of the criteria - Meets the Standard

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Course Success by Gender Action Narrative (If Applicable) - *Describe proposed actions to stabilize/increase the course success rates for either male, female, or non-binary.*				
Overall, in this section:	The narrative includes all 5 of the criteria - Meets the Standard	The narrative includes all 5 of the criteria - Meets the Standard	The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes all 5 of the criteria - Meets the Standard
Reader Feedback	N/A	The physics department once again mentions their efforts to continue to increase their course success rate which is great.	In this particular case, women are definitely improving in success numbers. This is a definite win.	N/A
b. Student Course Success by Ethnicity				
What does the data trend indicate about program student course success by ethnicity?				
African Americans	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard	Course success has improved over the time span - Excellent	Course success has improved over the time span - Excellent	Course success has improved over the time span - Excellent
Asian	Course success has improved over the time span – Excellent	Course success has improved over the time span - Excellent	Course success has improved over the time span - Excellent	Course success has improved over the time span - Excellent
Filipinx	Course success has been flat or decreased over the	Course success has decreased over the time	Course success has decreased over the time	Course success has been flat or decreased over the

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	time span by no more than 2 percentage point - Meets the Standard	span by more than 4 percentage points - Needs Major Improvement to Meet the Standard	span by more than 4 percentage points - Needs Major Improvement to Meet the Standard	time span by no more than 2 percentage point - Meets the Standard
Latinx	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard	Course success has improved over the time span - Excellent	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard
Native American	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard	Course success has improved over the time span - Excellent	Course success has improved over the time span - Excellent
Pacific Islander	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard	Course success has improved over the time span - Excellent	Course success has improved over the time span - Excellent
White	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard	Course success has improved over the time span - Excellent	Course success has improved over the time span - Excellent	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard
Decline to State	Course success has decreased over the time span by no more than 4 percentage points - Needs	Course success has been flat or decreased over the time span by no more than 2 percentage point - Meets the Standard	Course success has decreased over the time span by more than 4 percentage points - Needs	

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	Some Improvement to Meet the Standard		Major Improvement to Meet the Standard	
Student Course Success by Ethnicity Narrative Explanation (If Applicable) - *If the data trend shows a decrease in any of the student ethnic groups' course success rates, explain why the percentage decreased for each (address each ethnic group by bullet point).*				
Overall, in this section:	The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes all 3 of the criteria - Meets the Standard
Student Course Success by Ethnicity Narrative Explanation (If Applicable) - *Describe the reasons for the gap in course success.*				
Overall, in this section:	The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes all 3 of the criteria - Meets the Standard	The narrative includes all 3 of the criteria - Meets the Standard
Student Course Success by Ethnicity Action Narrative (If Applicable) - *Describe the proposed actions for stabilizing/improving the course success by ethnicity.*				
Overall, in this section:	The narrative includes 4 of the criteria - Needs Some Improvement to Meet the Standard	The narrative includes all 5 of the criteria - Meets the Standard	The narrative includes all 5 of the criteria - Meets the Standard	The narrative includes all 5 of the criteria - Meets the Standard
Reader Feedback	The data on success rates does not show a clear trend in the African American success rates. Filipinx success rates did not change significantly in three years suggesting that the first data point (2016-	I think overall the physics department is well aware of the disparity between genders and ethnicity groups in the field. This is something prevalent at the national level, not only in the department. They have	I applaud the Physics department for its efforts to outreach to local high schools and the community at large. I appreciate the passion and energy it takes to continue these efforts, especially	Overall, this is a well written program review: reflective and has clear action items. We are currently offering single sections. We will look at this year's data and make some adjustments and

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	17) was an anomaly. Otherwise the decrease in success rate for students who have declined to state their ethnicity does correlate with the enrollment numbers in that category shifting to the Asian category and so as mentioned in the Narrative this trend can be explained. Overall there have been improvements in success rates for non-targeted groups. The Physics department seems well aware of this issue and is appropriately focused on addressing it by moving to a novel lecture-lab learning environment in which community building and active learning may be maximized.	proposed methods to make lectures more inclusive and also proposed methods to increase their cultural humility by attending professional development workshops.	when it comes to the Physics Show which is given several times a year.	explore this as a more sustaining solution.