# Physics BA and BS



### **Annual Assessment Plan**



#### PLO#1 - Foundational Content

Graduates will demonstrate an understanding of the foundational theories, principles and concepts of physics.

# Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

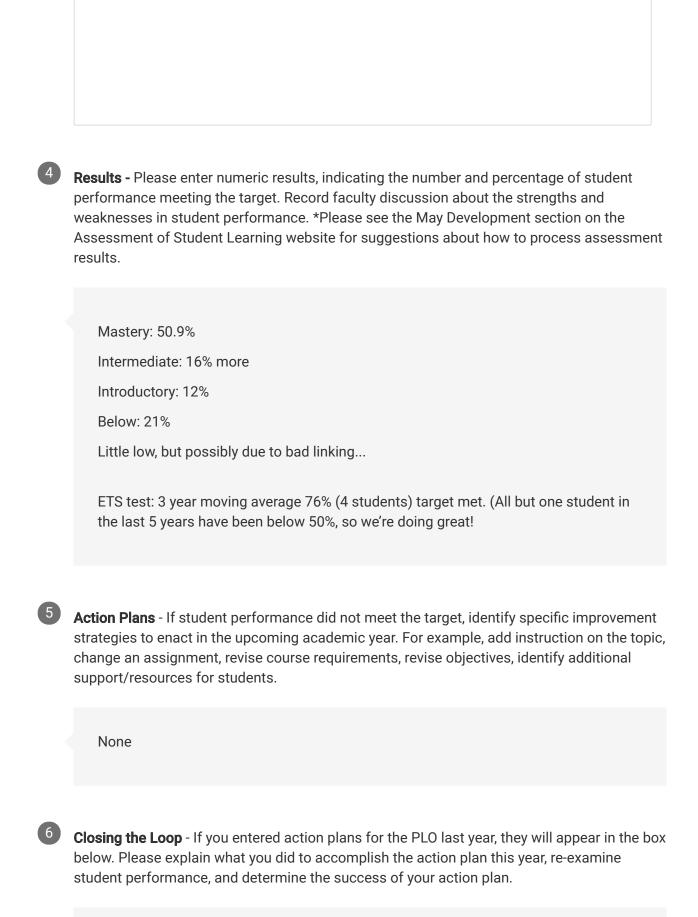
# 3 Please Enter The Following Information Below:

**Measures** - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

**Timeline** - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
"Proficient"-level achievement or better across all "Introductory" course learning outcomes linked to the PLO.	75%	Annually
"Proficient"-level achievement or better across all "Development" course learning outcomes linked to the PLO.	80%	Annually
"Proficient"-level achievement or better across all "Mastery" course learning outcomes linked to the PLO.	85%	Annually
ETS Major Field Test Score	75%ile	3-year moving average assessed annually.



- 1. Due to low number of students, data for upper-level classes (Mastery-level) might not be reliable. Going forward, we will <u>assess</u> annually but <u>aggregate</u> results on rolling 3-year basis.
- 2. Link AEFIS to more specific assignments, targeted at the specific PLO.
- 3. Change level for tests to basic 65%, proficient 75%, Advanced 85%.

PROGRESS: still need to do

#### 3 PLO#2 - Engage with Scientific Literature

Graduates will be able to retrieve, read and discuss primary scientific literature.

### Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

Please Enter The Following Information Below:

**Measures** - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

**Timeline** - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
"Proficient"-level achievement or better across all "Developing" course learning outcomes linked to the PLO.	75%	Assessed annually
"Proficient"-level achievement or better across all "Mastery" course learning outcomes linked to the PLO.	85%	Assessed annually

Results - Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. \*Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

AEIFIS link not working, but...:

100% proficient in PHYS 494 discussion assignment

- Action Plans If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.
  - o Find better way to teach and assess this.
  - o Add SCIE 393 to AEFIS linking
- Closing the Loop If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.
  - 1. Due to low number of students, data might not be reliable. Going forward, we will assess annually but aggregate results from last 3 years.
  - 2. Link AEFIS to more specific assignments, targeted at the specific PLO.

PROGRESS: still need to do

#### PLO#3 - Scientific Communication

Graduates will communicate physics concepts, processes and results effectively, both orally and in writing.

# Outcome(s)

Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

Choose one or more Institution outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

# 3 Please Enter The Following Information Below:

**Measures** - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

**Targets** - Percentage of students expected to earn a particular score on the measure.

**Timeline** - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
"Proficient"-level achievement or better across all "Introductory" course learning outcomes linked to the PLO.	75%	Assessed annually
"Proficient"-level achievement or better across all "Developing" course learning outcomes linked to the PLO.	80%	Assessed annually
"Proficient"-level achievement or better across all "Mastery" course learning outcomes linked to the PLO.	85%	Assessed annually

Results - Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. \*Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

100% proficient according to AEFIS

Action Plans - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

None

- Closing the Loop If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.
  - 1. Due to low number of students, data might not be reliable. Going forward, we will assess annually but aggregate results from last 3 years.
  - 2. Link AEFIS to more specific assignments, targeted at the specific PLO.
  - 3. Add PLO to other courses, like PHYS251, 402, 421.

PROGRESS: still need to do

#### **PLO#4 - Independent Problem Solving**

Graduates will apply content knowledge to independent problem solving in the physical sciences.

### Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

# 3 Please Enter The Following Information Below:

**Measures** - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

**Timeline** - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
"Proficient"-level achievement or better across all "Introductory" course learning outcomes linked to the PLO.	75%	Assessed annually
"Proficient"-level achievement or better across all "Developing" course learning outcomes linked to the PLO.	80%	Assessed annually
"Proficient"-level achievement or better across all "Mastery" course learning outcomes linked to the PLO.	85%	Assessed annually

Results - Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. \*Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

Mastery 33%

Developing 33%

Introductory 4%

Below 29%

Action Plans - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

- o Need to check linking and levels. Some links don't seem to be working
- o Data probably skewed due to some students not doing the assignments
- Closing the Loop If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.
  - 1. Reduce "Proficiency" lower boundary to 70% for linked assignments.
  - 2. Due to low number of students, data might not be reliable. Going forward, we will assess annually but aggregate results from last 3 years.
  - 3. Link AEFIS to more specific assignments, targeted at the specific PLO.
  - 4. Need to link from 322/422/494

PROGRESS: Still need to do

#### 6 PLO#5 - Art of Experimentation

Graduates will engage with the art of experiment through experimental design, experimental performance, quantitative data analysis, and scientific reporting

# Outcome(s)

Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

3 Please Enter The Following Information Below:

**Measures** - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

**Targets** - Percentage of students expected to earn a particular score on the measure.

**Timeline** - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
"Proficient"-level achievement or better across all "Introductory" course learning outcomes linked to the PLO.	75%	Assessed annually
"Proficient"-level achievement or better across all "Developing" course learning outcomes linked to the PLO.	80%	Assessed annually
"Proficient"-level achievement or better across all "Mastery" course learning outcomes linked to the PLO.	85%	Assessed annually

Results - Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. \*Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

100% pass according to AEFIS – only from PHYS 251

- Action Plans If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.
  - Need to link open-ended labs from PHYS211, and links 322/422/494
  - o Remove PHYS 317
- Closing the Loop If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.
  - 1. Due to low number of students, data might not be reliable. Going forward, we will assess annually but aggregate results from last 3 years.
  - 2. Link AEFIS to more specific assignments, targeted at the specific PLO.
  - 3. Need to link from 322/422/494

PROGRESS: Still need to do

### PLO#6 - Computational Skills

Graduates will be able to use basic computational techniques for modeling physical systems, including those that don't have analytical answers.

# Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

2 Choose one or more Institution outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

Please Enter The Following Information Below:

**Measures** - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

**Timeline** - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
"Proficient"-level achievement or better across all "Introductory"-level course learning outcomes linked to the PLO.	75%	Assessed annually
"Proficient"-level achievement or better across all "Developing"-level course learning outcomes linked to the PLO.	80%	Assesesd annually
"Proficient"-level achievement or better across all "Introductory"-level course learning outcomes linked to the PLO.	85 %	Assessed annually

Results - Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. \*Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

No data, but all students who completed the assignment in PHYS 402 were proficient (one did not complete the assignment)

Action Plans - If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.

Implement Matlab and other computational assignments to PHYS 251, 317, 328, 402, 421, 425, and add links

- Closing the Loop If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.
  - 1. Due to low number of students, data might not be reliable. Going forward, we will assess annually but aggregate results from last 3 years.
  - 2. Link AEFIS to more specific assignments, targeted at the specific PLO.
  - 3. Need to link from 322/422/494

PROGRESS: still need to do

#### 8 PLO#7 - Vocation

Graduates will identify and evaluate their vocation as it relates to their faith and career options in the physical sciences or related fields.

## Outcome(s)

1 Choose one or more accreditor outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

Choose one or more Institution outcome that aligns with your Program Learning Outcome.

There is no selected outcome.

Please Enter The Following Information Below:

**Measures** - Need to name specific course/ required experience plus exact exam items, assignments, rubric lines, etc. used for the analysis of performance on the PLO.

Targets - Percentage of students expected to earn a particular score on the measure.

**Timeline** - The frequency with which the department will analyze and report student performance on the PLO.

Measures	Targets	Timeline
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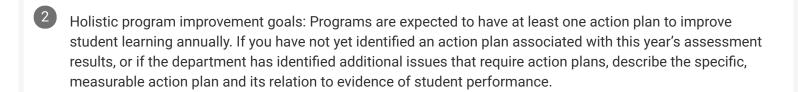
Results - Please enter numeric results, indicating the number and percentage of student performance meeting the target. Record faculty discussion about the strengths and weaknesses in student performance. \*Please see the May Development section on the Assessment of Student Learning website for suggestions about how to process assessment results.

No data, but 100% proficient on assignment in PHYS 494

- Action Plans If student performance did not meet the target, identify specific improvement strategies to enact in the upcoming academic year. For example, add instruction on the topic, change an assignment, revise course requirements, revise objectives, identify additional support/resources for students.
- Closing the Loop If you entered action plans for the PLO last year, they will appear in the box below. Please explain what you did to accomplish the action plan this year, re-examine student performance, and determine the success of your action plan.

- 1. Due to low number of students, data might not be reliable. Going forward, we will assess annually but aggregate results from last 3 years.
- 2. Link AEFIS to more specific assignments, targeted at the specific PLO.
- 3. Need to link from PHYS494
- 4. Evaluate how PLO can be included at Intro and developing levels.

PROGRESS: still need to do



The program is overall good.

A couple of action items:

- · Proliferate the use of Matlab in most upper-level physics courses
- . Make sure we have assignments that align with CLOs, and make sure linking is set up properly

#### **Assessment Rubric**



#### **Process**

	1	2	3	4
Is the plan being implemented faithfully and revised as needed?	Assessment plan is not implemented.	Most aspects of plan are being implemented or all aspects are implemented to some degree.	Assessment plan is fully implemented.	Plan is faithfully executed and modified/evaluated as needed.



Still many assignment links missing, and assignments that don't perfectly align with the CLOs

3

### **Engagement**

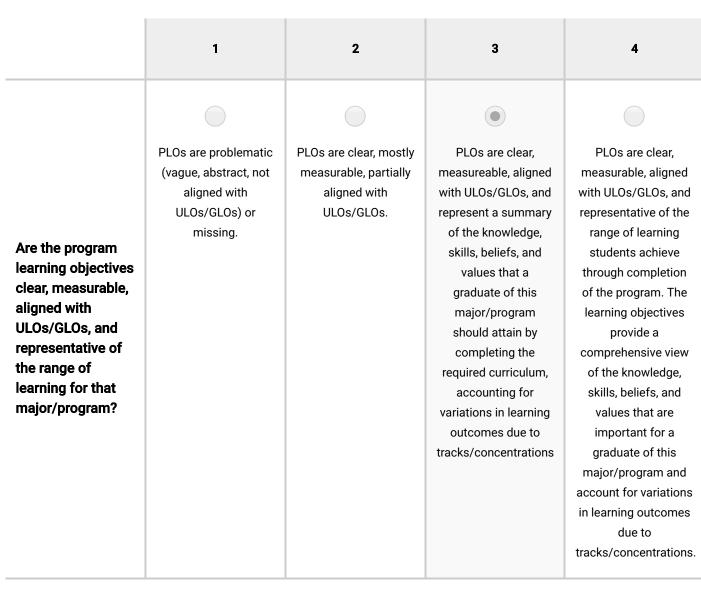
	1	2	3	4
Are all relevant parties are meaningfully involved in the creation/revision, implementation, analysis, interpretation and learning improvement process?	Limited involvement beyond chair/director	All educators contributing to the curriculum are aware of process and results	All educators contributing to the curriculum participate in conversations regarding the use of assessment data to improve student learning	All relevant stakeholders (students, employers, alumni) are meaningfully involved in the creation/revision, implementation, analysis, interpretation, and/or improvement processes associated with this assessment plan.

4 Explanations:

Engagement is good from all physics faculty

5

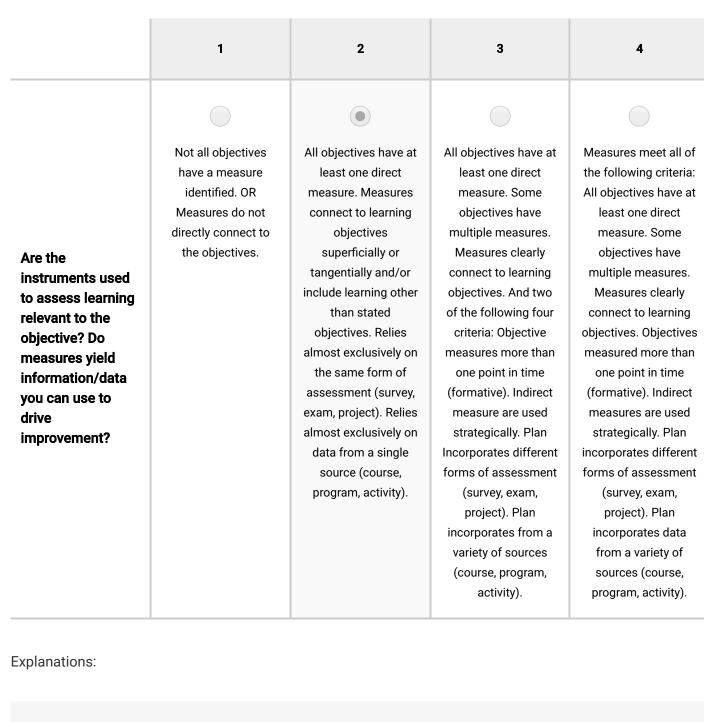
### **Program Learning Objectives**



Learning objectives are good

**Measures** 

1 2 3 4



Some linking is missing, and some assignments are not perfectly aligned with CLOs

**Targets** 

1	2	3	4

	1	2	3	4
Are the targets based on professional standards and/or analysis of past student work? Are targets challenging and achievable?	Some targets are missing.	Targets are arbitrarily chosen or reflect minimal expectations.	Targets are challenging and achievable based on prior student performance, and reflect an appropriate level of performance.	Targets are challenging and achievable. Targets are based on professional standards and/or prior student performance. Targets are set at a level to inspire program improvement.

Hard to set relevant targets when we don't have that much relevant data



### **Timeline**

1	2	3	4
·	_	-	

	1	2	3	4
Is the timeline for data collection manageable with sufficient data points to effectively inform decision making and program review?	Not identified clearly for all measures.	Clearly states semester/year for each objective/measure. Data analysis delayed from data collection. Time between collection points may not facilitate informed decision making.	Clearly stated and manageable schedule. At least two data points for each objective per review cycle.	Timeline for data collection is manageable and allows for continuous improvement with timely and meaningful decision making even before program review.

Need to update some measures to average over a longer time

Action Plan

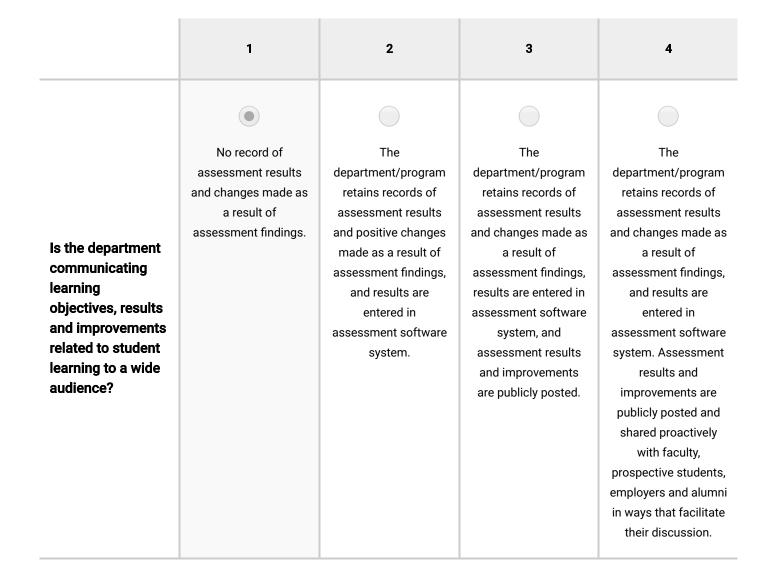
1	2	3	4

Hard to make relevant action plans without having more relevant data

15

#### Dissemination

1	2	3	4



What "wide audience" are we supposed to communicate to?

### **Additional Feedback**

1 Please enter any additional feedback for changes that should be made:

**CLOSE AND EXIT**