BS in Physics - BS-PHYS

Academic year 2024-2025

BS in Physics - BS-PHYS Learning Outcomes

SLO#1: Develop proficiency in critical thinking.

Students will learn about basic concepts of quantum mechanics, Schrodinger's equation and wave functions (PHYS 4320, Quantum Mechanics), and about light-matter interaction; interference; diffraction; spectroscopy; photonics and lasers; fiber optics (PHYS 4480, Optics). These courses are used to assess SLO #1.

MEASURES	RESULTS						ACTIONS
	MET						No actions have been added.
SLO #1: Assessment using PHYS							
4320 and PHYS 4480	Analysis						
The students will be tested, late in	The following tak	ole illustrates	the results	of our a	analysi	s for the	
the semester, their written exams	nester, their written exams 2024-2025 AY:						
will be collected and copied	COMBINED						
before being returned to them. For each area investigated the results	2024-2025	10					
below are given in terms of how	OKIL I	15)/51 4 11	-\/=\ 0 \ -\	/EL 0	E\/EL 4	TOTAL >	
the student scores are distributed	SKILL	LEVEL 1 LE	EVEL 2 LEV	/EL3 L	EVEL 4	3	
on the skill levels 1-4, with skill	1		0.0		0.0%		
evel 1 being the lowest and skill evel 4 being the highest.	II	0.0% 0.	0.0	% 10	0.0%	100.00%	
Following skills are used in the	III	0.0% 0.	0% 3.3	% 96	6.7%	100.00%	
assessment process:	IV	0.0% 3.	3% 6.7	% 90	0.0%	96.67%	
 Attaching the correct meaning to the given information with proper units. Identifying for what the physics problem is asking. Identifying the physics relationships that need to be used. 	Based on the about hreshold at or all that Outcome 1 is number of stude results (combine years. Such cum follows:	oove Level # s met. Since nts, it is more d) with the c	3 for all ski every year e helpful to umulative i	lls I-IV. T we test compar esults o	Thus, warelatine this yet a relation for this yet a relation for the part of t	e consider vely small rear's ast few	
Correct application of mathematics and reaching	CUMULATIVE DATA FOR OUTCOME 1, 2009-2024 (166 Students):						
the correct numerical solution.	CUMULATIVE 2009-2024	166					
Their distribution is indicated with	SKILL	LEVEL 1 L	EVEL 2 LE	VEL 3	LEVEL	4 TOTAL >	
percentages in the Rubric. In	1	0.3%	2.2% 17	.1%	76.1%	93.2%	
calculating the percentages, we	II	0.9%	3.6% 22	2.9%	66.8%	89.7%	
used the following procedure: For	III	2.1%	4.7% 26	6.4%	31.4%	87.8%	
each student in each skill nvestigated, we obtained scores	IV	2.1%	9.5% 29	0.4%	52.4%	81.9%	
by averaging those received from							
faculty members. Then, for each area investigated, we calculated the percentage of students that	COMPARATIVE D	ATA FOR OU	JTCOME 1,	2024-20	025 vs.	2009-	
fall within each skill level. *Skill levels:	COMPARATIVE 2	2024-2025					
Level 1: Unacceptable – 1 point.	VS 2009-2024			,			
The student's answer is very poor. Level 2: Poor – 2 points. The	SKILL LEVEL 1		LEVEL 3	LEVI		TOTAL > 3	
student's answer is acceptable.	1 -0.32%	-2.25%	-17.14%	23.9		6.77%	
_evel 3: Acceptable– 3 points. The	II -0.92%	-3.57%	-22.91%	33.20		10.28%	
student's answer has minor deficiencies. Level 4: Well done – 4 points. The student shows command of the subject.	III -2.13% IV -2.13%	-4.67% -6.18%	-23.09% -22.77%			12.21% 14.79%	
Direct - Exam (Course)							
Introduction Quantum Mechanics: PHYS 4320							

2024-2025 Assessment Plans and Reports

BS in Physics - BS-PHYS

We aim at 86% of students scoring at or above skill level 3.		
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SLO#2 Develop mathematical models and standard derivations in Physics.

Students will learn about basic concepts of quantum mechanics, Schrodinger's equation and wave functions (PHYS 4320, Quantum Mechanics), and about crustal structure, crystal dynamics, energy bands in crystalline solids, semiconductors, magnetism, and superconductivity (PHYS 4370, Solid State Physics). These courses are used to assess SLO #2.

MEASURES	RESULTS	ACTIONS
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SLO #2: Assessment using PHYS 4320 and PHYS 4370

The students will be tested, late in the semester, their written exams will be collected and copied before being returned to them. For each area investigated the results below are given in terms of how the student scores are distributed on the skill levels 1-4, with skill level 1 being the lowest and skill level 4 being the highest. Following skills are used in the assessment process:

- Attaching the correct meaning to the given information with proper units.
- 2. Identifying for what the physics problem is asking.
- Identifying the physics relationships that need to be used.
- Correct application of mathematics and reaching the correct numerical solution.

Their distribution is indicated with percentages in the Rubric. In calculating the percentages, we used the following procedure: For each student in each skill investigated, we obtained scores by averaging those received from faculty members. Then, for each area investigated, we calculated the percentage of students that fall within each skill level.

Level 1: Unacceptable – 1 point. The student's answer is very poor. Level 2: Poor – 2 points. The student's answer is acceptable. Level 3: Acceptable– 3 points. The student's answer has minor deficiencies.

Level 4: Well done – 4 points. The student shows command of the subject.

Direct - Exam (Course)

Introduction Quantum Mechanics: PHYS 4320

Target

We aim at 86% of students scoring at or above skill level 3.

MET

Analysis

COMBINED DATA FOR OUTCOME 2, 2024-2025 (7 students):

The following table illustrates the results of our analysis for the 2024-2025 AY:

COMBINED 2024-2025	7				
SKILL	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	TOTAL >
1	0.00%	0.00%	28.57%	71.43%	100.00%
II	0.00%	0.00%	42.86%	57.14%	100.00%
III	0.00%	0.00%	33.33%	66.67%	100.00%
IV	0.00%	0.00%	42.86%	57.14%	100.00%

Based on the above data, we reached our goal of 86% cumulative threshold at or above Level #3 for all skills I-IV. Thus, we consider that Outcome 2 is met. Since every year we test a relatively small number of students, it is more helpful to compare this year's results (combined) with the cumulative results of the past few years. Such cumulative results and combined results are as follows:

CUMULATIVE DATA FOR OUTCOME 2, 2009-2024 (173 Students):

2009-2024	173				
SKILL	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	TOTAL > 3
1	0.00%	3.05%	13.21%	78.18%	91.39%
II	0.31%	4.35%	27.72%	63.80%	91.52%
III	0.31%	5.21%	27.76%	62.88%	90.65%
IV	0.31%	5.97%	26.34%	66.63%	92.97%

COMPARATIVE DATA FOR OUTCOME 2, 2024-2025 vs. 2009-2024:

COMPARATIVE 2024-2025

CUMULATIVE ...

VS 2009-2024

SKILL	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	TOTAL > 3
1	0.00%	-3.05%	15.36%	-6.76%	8.61%
II	-0.31%	-4.35%	15.14%	-6.66%	8.48%
Ш	-0.31%	-5.21%	5.57%	3.78%	9.35%
IV	-0.31%	-5.97%	16.52%	-9.49%	7.03%

No actions have been added.

SLO#3: Communicating Physics processes in writing.

Students will learn about crustal structure, crystal dynamics, energy bands in crystalline solids, semiconductors, magnetism, and superconductivity (PHYS 4370, Solid State Physics), and about light-matter interaction; interference; diffraction; spectroscopy; photonics and lasers; fiber optics (PHYS 4480, Optics). These courses are used to assess SLO #3.

MEASURES	RESULTS					ACTIONS
SLO #3: Assessment using PHYS	MET					No actions have been added.
4370 and PHYS 4480	Analysis					
The students will be tested, late in the semester, their written exams	COMBINED DATA	FOR OUTCO				
will be collected and copied before being returned to them. For each area investigated the results below	The following table illustrates the results of our analysis for the 2024-2025 AY:					
are given in terms of how the student scores are distributed on the skill levels 1-4, with skill level 1	COMBINED 2024-2025	11				
being the lowest and skill level 4 being the highest. Following skills	SKILL		EVEL 2 LEVE		3	
are used in the assessment	I		.03% 24.24			
process:	II		.06% 48.48			
	III	0.00% 3.	.03% 33.33	8% 63.64%	6 96.97%	
Attaching the correct meaning to the given	IV	12.12% 9.	.09% 33.33	3% 45.45%	% 78.79%	
information with proper units. 2. Identifying for what the physics problem is asking. 3. Identifying the physics relationships that need to be used. 4. Correct application of mathematics and reaching	Based on the about threshold at or all consider that Ou test a relatively so compare this year of the past few y results are as fol	cove Level # tcome 3 is m mall number or's results (c ears. Such c	3 for all skills let/partially mof students, combined) wi	but Skill IV. et. Since ev it is more he th the cumu	Thus, we very year we elpful to lative results	
the correct numerical solution.	CUMULATIVE DA	TA FOR OUT	COME 3, 200	09-2024 (22	24 Students):	
Their distribution is indicated with	CUMULATIVE 2009-2024	224				
percentages in the Rubric. In calculating the percentages, we	SKILL	LEVEL 1 L	EVEL 2 LEVE	L 3 LEVEL	TOTAL >	
used the following procedure: For	1	0.53% 3	3.96% 19.15	% 70.59%	6 89.74%	
each student in each skill	Ш	0.24% 4	1.32% 26.6	7% 61.70%	88.37%	
investigated, we obtained scores	III	0.24% 5	5.62% 31.33	3% 57.03%	6 88.37%	
by averaging those received from faculty members. Then, for each area investigated, we calculated	IV	0.39% 7		0% 49.569		
the percentage of students that fall within each skill level. *Skill levels:	COMPARATIVE D	ATA FOR OU	JTCOME 3, 20)24-2024 v:	s. 2009-	
Level 1: Unacceptable – 1 point. The student's answer is very poor.	COMPARATIVE 2					
Level 2: Poor – 2 points. The	2009-2024					
student's answer is acceptable.	SKILL LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	TOTAL > 3	
Level 3: Acceptable– 3 points. The student's answer has minor	I -0.53%	-0.93%	5.09%	2.14%	7.23%	
deficiencies.	II -0.24%	1.74%	21.82%	-16.25%	5.57%	
Level 4: Well done – 4 points. The	III -0.24%	-2.59%	2.00%	6.60%	8.60%	
student shows command of the subject.	IV 11.73%	1.71%	-3.56%	-4.11%	-7.67%	
Direct - Exam (Course)						
Solid State Phys: PHYS 4370						
Target						
We aim at 86% of students scoring at or above skill level 3.						

General Outcome Actions

ACTIONS

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Additional Training

IN PROGRESS

Extra home works and/or lab work might be necessary in PHYS 4480 so that the SLO #3 could be fully met in Skill Level IV. The definitions of skill levels have been provided in measures.

Recommended Due Date: 05/15/2026