

BS in Physics - BS-PHYS

Academic Year 2025-2026

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																																																																																																																							
SLO #1: Assessment using PHYS 4320 and PHYS 4480 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: 1. Attaching the correct meaning to the given 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 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. *Skill levels: 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-based) <i>Introduction Quantum Mechanics: PHYS 4320</i> Target	NOT MET Summary COMBINED DATA FOR OUTCOME 1, 2025-2026 (9 students) The following table illustrates the results of our analysis for the 2024-2025 AY: <table><tr><td>COMBINED 2025-2026</td><td>9</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>SKILL</td><td>LEVEL 1</td><td>LEVEL 2</td><td>LEVEL 3</td><td>LEVEL 4</td><td>TOTAL > 3</td><td></td></tr><tr><td>I</td><td>0.0%</td><td>6.3%</td><td>29.6%</td><td>54.5%</td><td>84.1%</td><td></td></tr><tr><td>II</td><td>0.0%</td><td>6.3%</td><td>26.5%</td><td>57.7%</td><td>84.1%</td><td></td></tr><tr><td>III</td><td>0.0%</td><td>12.7%</td><td>30.2%</td><td>47.6%</td><td>77.8%</td><td></td></tr><tr><td>IV</td><td>0.0%</td><td>16.4%</td><td>38.1%</td><td>36.0%</td><td>74.1%</td><td></td></tr></table> Based on the above data, we have not reached our goal of 87% cumulative threshold at or above Level #3 for all skills I-IV for AY 2025-2026. However, 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 1, 2009-2025 (175 Students) <table><tr><td>CUMULATIVE 2009-2025</td><td>175</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>SKILL</td><td>LEVEL 1</td><td>LEVEL 2</td><td>LEVEL 3</td><td>LEVEL 4</td><td>TOTAL > 3</td><td></td></tr><tr><td>I</td><td>0.3%</td><td>2.1%</td><td>16.3%</td><td>77.9%</td><td>94.2%</td><td></td></tr><tr><td>II</td><td>0.9%</td><td>3.4%</td><td>21.7%</td><td>69.1%</td><td>90.8%</td><td></td></tr><tr><td>III</td><td>2.0%</td><td>4.4%</td><td>25.3%</td><td>63.7%</td><td>89.0%</td><td></td></tr><tr><td>IV</td><td>2.0%</td><td>9.2%</td><td>28.3%</td><td>54.9%</td><td>83.2%</td><td></td></tr></table> COMPARATIVE DATA FOR OUTCOME 1, 2025-2026 vs. 2009-2025 COMPARATIVE 2025-2026 VS 2009-2025 <table><tr><td>SKILL</td><td>LEVEL 1</td><td>LEVEL 2</td><td>LEVEL 3</td><td>LEVEL 4</td><td>TOTAL > 3</td><td></td></tr><tr><td>I</td><td>-0.30%</td><td>4.22%</td><td>13.37%</td><td>-23.39%</td><td>-10.02%</td><td></td></tr><tr><td>II</td><td>-0.88%</td><td>2.96%</td><td>4.72%</td><td>-11.41%</td><td>-6.69%</td><td></td></tr><tr><td>III</td><td>-2.02%</td><td>8.26%</td><td>4.90%</td><td>-16.11%</td><td>-11.21%</td><td></td></tr><tr><td>IV</td><td>-2.02%</td><td>7.19%</td><td>9.79%</td><td>-18.91%</td><td>-9.12%</td><td></td></tr></table> Based on the cumulative data, we see that we reached our goal of 87% cumulative for all skill levels except skill level IV. Thus we consider Outcome 1 is partially met.	COMBINED 2025-2026	9						SKILL	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	TOTAL > 3		I	0.0%	6.3%	29.6%	54.5%	84.1%		II	0.0%	6.3%	26.5%	57.7%	84.1%		III	0.0%	12.7%	30.2%	47.6%	77.8%		IV	0.0%	16.4%	38.1%	36.0%	74.1%		CUMULATIVE 2009-2025	175						SKILL	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	TOTAL > 3		I	0.3%	2.1%	16.3%	77.9%	94.2%		II	0.9%	3.4%	21.7%	69.1%	90.8%		III	2.0%	4.4%	25.3%	63.7%	89.0%		IV	2.0%	9.2%	28.3%	54.9%	83.2%		SKILL	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	TOTAL > 3		I	-0.30%	4.22%	13.37%	-23.39%	-10.02%		II	-0.88%	2.96%	4.72%	-11.41%	-6.69%		III	-2.02%	8.26%	4.90%	-16.11%	-11.21%		IV	-2.02%	7.19%	9.79%	-18.91%	-9.12%		<i>No actions have been added.</i>
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We aim at 87% of students scoring at or above skill level 3.	Physics - Annual Program Assessment Report 25-26.docx Analysis SLO #1: We met all our targets in AY 2025-2026 except SLO #1, which was partially met. We will discuss additional plans with Physics faculty in Fall of 2026 and raise our goals for upcoming academic year for continued improvement. These plans will be revealed in our Action Plan in Fall 2026.	
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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 crystal 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.

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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: 1. Attaching the correct meaning to the given 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 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. *Skill levels: 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.	MET Summary Based on the cumulative and combined data, we see that we reached out goal of 87% cumulative for all skill levels. Thus we consider Outcome 2 is met. Physics - Annual Program Assessment Report 25-26.docx Analysis COMBINED DATA FOR OUTCOME 2, 2025-2026 (7 students) The following table illustrates the results of our analysis for the 2025-2026 AY: <table><tr><td>COMBINED 2025-2026</td><td colspan="5">7</td></tr><tr><td>SKILL</td><td>LEVEL 1</td><td>LEVEL 2</td><td>LEVEL 3</td><td>LEVEL 4</td><td>TOTAL > 3</td></tr><tr><td>I</td><td>0.00%</td><td>0.00%</td><td>4.76%</td><td>95.24%</td><td>100.00%</td></tr><tr><td>II</td><td>0.00%</td><td>0.00%</td><td>19.05%</td><td>80.95%</td><td>100.00%</td></tr><tr><td>III</td><td>0.00%</td><td>9.52%</td><td>33.33%</td><td>57.14%</td><td>90.48%</td></tr><tr><td>IV</td><td>0.00%</td><td>0.00%</td><td>28.57%</td><td>71.43%</td><td>100.00%</td></tr></table> Based on the above data, we reached our goal of 87% 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, 2009-2025 (180 Students) <table><tr><td>CUMULATIVE 2009-2025</td><td colspan="5">180</td></tr><tr><td>SKILL</td><td>LEVEL 1</td><td>LEVEL 2</td><td>LEVEL 3</td><td>LEVEL 4</td><td>TOTAL > 3</td></tr><tr><td>I</td><td>0.00%</td><td>2.93%</td><td>13.81%</td><td>77.92%</td><td>91.73%</td></tr><tr><td>II</td><td>0.30%</td><td>4.19%</td><td>28.31%</td><td>63.54%</td><td>91.85%</td></tr></table>	COMBINED 2025-2026	7					SKILL	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	TOTAL > 3	I	0.00%	0.00%	4.76%	95.24%	100.00%	II	0.00%	0.00%	19.05%	80.95%	100.00%	III	0.00%	9.52%	33.33%	57.14%	90.48%	IV	0.00%	0.00%	28.57%	71.43%	100.00%	CUMULATIVE 2009-2025	180					SKILL	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	TOTAL > 3	I	0.00%	2.93%	13.81%	77.92%	91.73%	II	0.30%	4.19%	28.31%	63.54%	91.85%	No actions have been added.
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Level 4: Well done – 4 points. The student shows command of the subject.	III	0.30%	5.00%	27.98%	63.03%	91.01%
Direct - Exam (Course-based)	IV	0.30%	5.74%	25.32%	64.04%	89.36%
<i>Introduction Quantum Mechanics: PHYS 4320</i>	COMPARATIVE DATA FOR OUTCOME 2, 2025-2026 vs. 2009-2025					
Target	COMPARATIVE 2025-2026 VS 2009-2025					
We aim at 87% of students scoring at or above skill level 3.	SKILL	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	TOTAL > 3
	I	0.00%	-2.93%	-9.04%	17.32%	8.27%
	II	-0.30%	-4.19%	-9.26%	17.41%	8.15%
	III	-0.30%	4.52%	5.35%	-5.89%	-0.53%
	IV	-0.30%	-5.74%	3.25%	7.39%	10.64%
	Based on the cumulative and combined data, we see that we reached our goal of 87% cumulative for all skill levels. Thus we consider Outcome 2 is met.					

SLO#3: Communicating Physics processes in writing.

Students will learn about crystal 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.

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SLO #3: Assessment using PHYS 4370 and PHYS 4480 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: 1. Attaching the correct meaning to the given 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 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	MET Physics - Annual Program Assessment Report 25-26.docx Analysis COMBINED DATA FOR OUTCOME 3, 2025-2026 (10 students) The following table illustrates the results of our analysis for the 2025-2026 AY: <table><tr><td>COMBINED 2025-2026</td><td>10</td></tr><tr><td>SKILL</td><td>LEVEL 1</td><td>LEVEL 2</td><td>LEVEL 3</td><td>LEVEL 4</td><td>TOTAL > 3</td></tr><tr><td>I</td><td>0.00%</td><td>11.43%</td><td>28.57%</td><td>51.43%</td><td>80.00%</td></tr><tr><td>II</td><td>0.00%</td><td>11.43%</td><td>20.00%</td><td>60.00%</td><td>80.00%</td></tr><tr><td>III</td><td>0.00%</td><td>11.43%</td><td>25.71%</td><td>54.29%</td><td>80.00%</td></tr><tr><td>IV</td><td>2.86%</td><td>14.29%</td><td>20.00%</td><td>54.29%</td><td>74.29%</td></tr></table> Based on the above data, we have not reached our goal of 87% cumulative threshold at or above Level #3 for any skill levels. 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 3, 2009-2025 (234 Students)	COMBINED 2025-2026	10	SKILL	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	TOTAL > 3	I	0.00%	11.43%	28.57%	51.43%	80.00%	II	0.00%	11.43%	20.00%	60.00%	80.00%	III	0.00%	11.43%	25.71%	54.29%	80.00%	IV	2.86%	14.29%	20.00%	54.29%	74.29%	No actions have been added.
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calculated the percentage of students that fall within each skill level. *Skill levels: 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-based) <i>Solid State Phys: PHYS 4370</i> Target We aim at 87% of students scoring at or above skill level 3.	<table><tr><th colspan="6">CUMULATIVE</th></tr><tr><th colspan="6">2009-2025</th></tr><tr><th colspan="6">234</th></tr><tr><th>SKILL</th><th>LEVEL 1</th><th>LEVEL 2</th><th>LEVEL 3</th><th>LEVEL 4</th><th>TOTAL > 3</th></tr><tr><td>I</td><td>0.51%</td><td>3.93%</td><td>19.47%</td><td>70.99%</td><td>90.46%</td></tr><tr><td>II</td><td>0.23%</td><td>4.42%</td><td>27.81%</td><td>61.20%</td><td>89.01%</td></tr><tr><td>III</td><td>0.23%</td><td>5.53%</td><td>31.56%</td><td>57.59%</td><td>89.15%</td></tr><tr><td>IV</td><td>0.94%</td><td>7.49%</td><td>36.89%</td><td>49.58%</td><td>86.47%</td></tr></table> COMPARATIVE DATA FOR OUTCOME 3, 2025-2026 vs. 2009-2025 <table><tr><th colspan="6">COMPARATIVE</th></tr><tr><th colspan="6">2025-2026 VS</th></tr><tr><th colspan="6">2009-2025</th></tr><tr><th>SKILL</th><th>LEVEL 1</th><th>LEVEL 2</th><th>LEVEL 3</th><th>LEVEL 4</th><th>TOTAL > 3</th></tr><tr><td>I</td><td>-0.51%</td><td>7.50%</td><td>9.10%</td><td>-19.56%</td><td>-10.46%</td></tr><tr><td>II</td><td>-0.23%</td><td>7.01%</td><td>-7.81%</td><td>-1.20%</td><td>-9.01%</td></tr><tr><td>III</td><td>-0.23%</td><td>5.90%</td><td>-5.85%</td><td>-3.30%</td><td>-9.15%</td></tr><tr><td>IV</td><td>1.92%</td><td>6.79%</td><td>-16.89%</td><td>4.71%</td><td>-12.18%</td></tr></table> Based on the cumulative data, we see that we reached our goal of 87% cumulative for all skills, except for Skill IV, which came short at 86.47%. We still consider Outcome 3 is met, as this could be due to statistical fluctuations.	CUMULATIVE						2009-2025						234						SKILL	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	TOTAL > 3	I	0.51%	3.93%	19.47%	70.99%	90.46%	II	0.23%	4.42%	27.81%	61.20%	89.01%	III	0.23%	5.53%	31.56%	57.59%	89.15%	IV	0.94%	7.49%	36.89%	49.58%	86.47%	COMPARATIVE						2025-2026 VS						2009-2025						SKILL	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	TOTAL > 3	I	-0.51%	7.50%	9.10%	-19.56%	-10.46%	II	-0.23%	7.01%	-7.81%	-1.20%	-9.01%	III	-0.23%	5.90%	-5.85%	-3.30%	-9.15%	IV	1.92%	6.79%	-16.89%	4.71%	-12.18%
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