

Assurance of Student Learning 2018-2019		
Ogden College of Science and Engineering		Physics and Astronomy
754 Physics		

Use this page to list learning outcomes, measurements, and summarize results for your program. Detailed information must be completed in the subsequent pages.

Student Learning Outcome 1: Students will develop a mastery of empirical methods

Instrument 1	Presentation of research projects in Physics 398 & 498.
Instrument 2	Presentation of research projects at local, state and national conferences.
Instrument 3	

Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 1.	Met	Not Met
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Student Learning Outcome 2: Students will show a mastery of foundational principles and requisite mathematics

Instrument 1	MFT Scores
Instrument 2	
Instrument 3	

Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 2.	Met	Not Met
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Program Summary (Briefly summarize the action and follow up items from your detailed responses on subsequent pages.)

We expect our students to develop and display a mastery of empirical methods used in Physics and Astronomy and display mastery of foundational principles and requisite mathematics. In the Junior and senior seminar courses, students often show weakness in expressing their empirical methods; this skill is reinforced throughout the laboratory curriculum. This weakness has been addressed via an increased emphasis on proper laboratory report preparation in the University Physics I (Physics 256) laboratory. The modifications to the University Physics I laboratory course began in Fall 2019. These students will not reach the Physics 398 course until Spring semester 2021. At that time we will be able to evaluate if there has been a detectable improvement in student ability to express empirical their methods. The next step is a modification to the University Physics II (Physics 266) laboratory course to further emphasize and improve these skills

The Major Field Test (MFT) subscores are monitored and used to determine areas in the curriculum where our students are not performing at or above national medians. Multi-year trends are used to determine curricular weakness and then the curriculum is examined to determine the appropriate course(s) to examine for improvement. The most recent subscore show our students remain within the bounds of the national medians for the introductory and advanced physics content knowledge, with no discernable trends. In

spring 2021, the first cohort of students who were taught introductory Physics with the Matter and Interactions curriculum will take the MFT. At that time we will be able to evaluate if the curricular change resulted in any gains or losses.

Student Learning Outcome 1

Student Learning Outcome	Students will develop a mastery of empirical methods		
Measurement Instrument 1	This will be measured by student performance in the physics 398 (Junior Seminar) and Physics 498 (Senior Seminar) courses. Students are required to present results of their research activities and submit a written project description in the course.		
Criteria for Student Success	Student receives a grade of C or better in the course.		
Program Success Target for this Measurement	90	Percent of Program Achieving Target	100
Methods	In 2018-2019 a total of 9 students were evaluated in the Physics 398 and 498 courses. Student oral and written presentations are evaluated based upon the following criteria: the content of the presentation was high quality, and the delivery of the presentation was high quality, and student made a serious effort to prepare for the presentation.		
Measurement Instrument 2	Successful presentation of research projects at local, state and national conferences		
Criteria for Student Success	Students will successfully present their research projects at local, state and/or national conferences.		
Program Success Target for this Measurement	75	Percent of Program Achieving Target	50
Methods	Faculty mentors (and/ or other program faculty will attend conferences with the students and evaluate the student presentations and report back to the department their evaluation of the student performance and whether or not the student presentation won an award at the conference.		
Measurement Instrument 3			
Criteria for Student Success			
Program Success Target for this Measurement		Percent of Program Achieving Target	
Methods			

Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 1.	Met	Not Met
Actions (Describe the decision-making process and actions planned for program improvement. The actions should include a timeline.)		
<p>The majority of students display a gradual maturation as they progress through the laboratory courses and/or engage in mentored research projects with faculty. This is evident in student presentations in the physics 398/498 course sequence, as well as in their preparation of research presentations as part of mentored research experiences. In the Junior and senior seminar courses, students often show weakness in expressing their empirical methods; this skill is reinforced throughout the laboratory curriculum. This weakness has been addressed via an increased emphasis on proper laboratory report preparation in the University Physics I (Physics 256) laboratory. The modifications to the University Physics I laboratory course began in Fall 2019. The next step is a modification to the University Physics II (Physics 266) laboratory course to further emphasize and improve these skills.</p>		
Follow-Up (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.)		
<p>The modifications to the University Physics I laboratory course began in Fall 2019. These students will not reach the Physics 398 course until Spring semester 2021. At that time we will be able to evaluate if there has been a detectable improvement in student ability to express empirical methods.</p>		

Student Learning Outcome 2

Student Learning Outcome	Students will show a mastery of foundational principles and requisite mathematics		
Measurement Instrument 1	NOTE: Each student learning outcome should have at least one direct measure of student learning . Indirect measures are not required.		
Criteria for Student Success	As a cohort, students will score at or above the national median in all subfields and in the total score of the ETS (acronym for ?).		
Program Success Target for this Measurement	100	Percent of Program Achieving Target	100
Methods	The ETS provides comparative institutional data medians for the MFT. WKU students as a cohort over the same time period score at the median (within the standard deviation) in the total score, as well as the introductory and advanced sub categories. The students take the MFT as rising juniors, thus not all of them have had the complete suite of advanced coursework, yet our students do just as well compared to their peers across the nation at the introductory and advanced level.		
Measurement Instrument 2			
Criteria for Student Success			
Program Success Target for this Measurement		Percent of Program Achieving Target	
Methods			
Measurement Instrument 3			
Criteria for Student Success			
Program Success Target for this Measurement		Percent of Program Achieving Target	
Methods			
Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 2.			Met
Actions (Describe the decision-making process and actions planned for program improvement. The actions should include a timeline.)			Not Met
The subscores are monitored and used to determine areas in the curriculum where our students are not performing at or above national medians. Multi-year trends are used to determine curricular weakness and then the curriculum is examined to determine the appropriate course(s) to examine for improvement. The most recent subscore show our students remain within the bounds of the national medians for the introductory and advanced physics content knowledge, with no discernable trends.			
Follow-Up (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.)			

In spring 2021, the first cohort of students who were taught introductory Physics with the Matter and Interactions curriculum will take the MFT. At that time we will be able to evaluate if the curricular change resulted in any gains or losses.