Physics and Engineering

Program Learning Outcome Assessment

2024-25

Program Learning Outcomes

Graduates from the Physics B.S. and B.A. programs will demonstrate the following learning outcomes:

1. an ability to identify, formulate, and solve complex problems by applying principles of science and mathematics.
2. an ability to apply physical principles, mathematical reasoning, and computational techniques to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
    - Students will effectively communicate complicated technical information in writing.
    - Students will effectively communicate complicated technical information orally.
    - Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand.
4. an ability to recognize ethical and professional responsibilities and make informed judgments, which must consider the impact of scientific solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use scientific judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Graduates from the Engineering program will demonstrate the following learning outcomes:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
    - Students will effectively communicate complicated technical information in writing.
    - Students will effectively communicate complicated technical information orally.
    - Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Note: Because these program learning outcomes are very similar and the assessment points for them are the same, assessment data for physics majors and engineering majors have been combined into a single report.

Physics and Engineering

Learning Outcome: ABET #1: Students will demonstrate an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. (CC: CT)

Outcome Measures and Criteria for Success:

Course	Outcome Assessed	Assessment Method	Threshold	Frequency
EGR2014 EGR2014L	Students will be able to set up a problem with the appropriate variables and solve the problem. (ME and EE)	Exam Question	At least 80% of the students will score 2.5 or higher on the associated rubric	Annually
EGR2024 EGR2024L	Students will be able to set up a problem with the appropriate variables and solve the problem. (all)	Exam Question	At least 80% of the students will score 2.5 or higher on the associated rubric	Annually
EGR3034 EGR3034L	Students will be able to apply a theoretical model to calculate a solution to a problem using appropriate computational techniques/software. (ME)	Exam Question	At least 80% of the students will score 2.5 or higher on the associated rubric	Alternating Year
EGR4103 (replaced EGR4013)	Students will be able to apply a theoretical model to calculate a solution to a problem using appropriate computational techniques/software. (EE and CSE)	Exam Question	At least 80% of the students will score 2.5 or higher on the associated rubric	Alternating Year
EGR4082	Students will demonstrate an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. (all)	Faculty/Review Team Assessment of Final Project	At least 80% of the teams will score 2.5 or higher on the associated rubric	Annually
EGR4082	Student reflection on preparation to solve problems using engineering, science and mathematics. (all)	Senior Survey (Indirect Method)	80% of the respondents will say that they are satisfied or higher	Annually

Longitudinal Data:
Note that the PHE department changed assessment processes to align with ABET expectations for engineering curriculum. The data shown is all that we are expected to collect for ABET, both formative and summative data. The italicized data is from our previous assessment system.

EGR2014 (Formative)	Percent of Students Above 2.5					
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Identify necessary information given in the problem to arrive at a solution.	100%	67%	77%	67%	73%	79%
Formulate appropriate equations with corresponding variables.	100%	67%	100%	67%	64%	79%
Solve the problem by applying the principles identified.	100%	67%	100%	67%	64%	79%

EGR2024 (Formative)	Percent of Students Above 2.5					
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Identify necessary information given in the problem to arrive at a solution.	100%	82%	90%	100%	57%	77%
Formulate appropriate equations with corresponding variables.	100%	73%	90%	100%	71%	77%
Solve the problem by applying the principles identified.	100%	73%	90%	88%	64%	38%

EGR3034 (Summative)	Percent of Students Above 2.5					
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Identify necessary information given in the problem to arrive at a solution.		81%		100%		100%
Formulate appropriate equations with corresponding variables.		81%		100%		82%
Solve the problem by applying the principles identified.		94%		100%		64%

EGR4013 - Old System (Summative)	Percent of Students Above 2.5			
	2019-20	2020-21	2021-22	2022-23
Identify necessary information given in the problem to arrive at a solution.	63%		87%	
Formulate appropriate equations with corresponding variables.	56%		87%	
Solve the problem by applying the principles identified.	63%		73%	

EGR4103 - New System (Summative)	Percent of Students Above 2.5					
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25*
Can identify a theoretical model to calculate a solution to a problem (EE and CSE)				100%		
Can apply appropriate computational techniques/software (EE and CSE)				100%		
Identify necessary information given in the problem to arrive at a solution.						100%
Formulate appropriate equations with corresponding variables.						82%
Solve the problem by applying the principles identified.						6%

* Used different rubric for 2024-25.

EGR4082 (Summative)	Percent of Students Above 2.5					
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Students will demonstrate an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics (all).	64%	40%	67%	100%	100%	100%

EGR4082 (Student Survey)	Percentage of Students Indicating Satisfied or Higher		
	2022-23	2023-24	2024-25
How well do you feel that you have been prepared to: [Apply the principles of knowledge of engineering, science, and mathematics to solve problems?]	100%	90%	71%

Previous Learning Outcome: Students will apply physical principles, mathematical reasoning, and computational techniques to solve real-world problems.

Previous Outcome Measure: Embedded final exam questions given in upper division mastery class on a rotating basis (EGR/PHY3063, EGR/PHY3043 and PHY4053).

Previous Criteria for Success (how do you judge if the students have met your standards): At least 75% of students will achieve an average score of 2.5 or higher on criteria described in application rubric.

Previous Data:

	Percentage Over 2.5									
	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
	PHY431	PHY361	PHY431	PHY361	PHY431	PHY361	PHY431	PHY3063	PHY/EGR3043	PHY/EGR3063
Application Rubric	84%	88%	82%	80%	71%	96%	81%	92%	100%	53%

***** Note the courses were renumbered in the 2019-20 academic year. PHY361 became PHY3063. PHY431 became PHY4053. At that time some courses were cross listed as both engineering and physics.*

Conclusions Drawn from Data:
The students are generally meeting our expectations in this area except in the area of "solving problems by principles identified." The most significant shortfall was in EGR4103 and it appears that the assignment was not aligned with the rubric used. We need to review assignments and continue to help students make connections between specific principles and problem solving techniques. As part of the senior project (advisory board assessment) the students did meet the benchmark. Note that the survey data asking the students to self-assess their abilities is near our benchmark. The sample size was small, and we had two students who negatively assessed all aspects of the program. This will be seen throughout the data in this report.

Changes to be Made Based on Data:
Review the assignments being used for the formative assessments to see what curricular insights can be gained from the students not hitting the benchmark. We are revising the curriculum map and assessment plan to be sure that we are assessing this skill in the right locations.

Rubric:
EGR2014 – Attached
EGR2024 – Attached
EGR3034 – Attached
EGR4013 – Attached
EGR4103 – Attached
EGR4082 – There is no rubric since it comes from the review sheet of the faculty and external

professional review committee.
Senior Survey – No rubric for this since they are survey results.

Engineering and Physics Rubric

PLO1: Student will demonstrate an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. (CC: CT)

Courses evaluated: EGR 2014/2014L, EGR 2024/2024L, EGR 3034/3034L, EGR 4013

Criteria	**4 – Excellent**	**3 – Good**	**2 – Fair**	**1 – Poor**
Identify necessary information given in the problem to arrive at a solution	No mistakes	Few mistakes, mostly correct	Some mistakes, some understanding	Many mistakes, not interpreting information
Formulate appropriate equations with corresponding variables	No mistakes	Few mistakes, mostly correct	Some mistakes, some understanding	Many mistakes, not interpreting information
Solve the problem by applying the principles identified	No mistakes	Few mistakes, mostly correct	Some mistakes, some understanding	Many mistakes, not interpreting information

EGR4103 Rubric

PLO1: Students will demonstrate an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. (CC: CT)

Outcome Assessed	Excellent (4)	Good (3)	Satisfactory (2)	Unsatisfactory (1)	Excellent (4)
Can identify a theoretical model to calculate a solution to a problem. (EE and CSE)	No mistakes	Few mistakes, mostly correct	Some mistakes, some understanding	Many mistakes, not interpreting information	No mistakes
Can apply appropriate computational techniques/software. (EE and CSE)	No mistakes	Few mistakes, mostly correct	Some mistakes, some understanding	Many mistakes, not interpreting information	No mistakes

Physics and Engineering

Learning Outcome: ABET #2: Students will demonstrate an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

Outcome Measures and Criteria for Success:

Course	Outcome Assessed	Assessment Method	Threshold	Frequency
EGR4072	Student design teams will be able to successfully implement an engineering design process to identify a feasible solution to a problem.	Faculty/Review Team Assessment of Project Proposal	At least 80% of the teams will score 2.5 or higher on the associated rubric	Annually
EGR4072	Student design teams will be able to describe the constraints that impact the engineering solution to a problem. Constraints should include the technical as well as considering public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	Faculty/Review Team Assessment of Project Proposal	At least 80% of the teams will score 2.5 or higher on the associated rubric	Annually
EGR4072	Student design teams will be able to build a budget for the project and discuss financial limitations.	Faculty/Review Team Assessment of Project Proposal	At least 80% of the teams will score 2.5 or higher on the associated rubric	Annually
EGR4082	Student design teams will be able to construct a prototype of their solution and evaluate is effectiveness.	Faculty/Review Team Assessment of Final Project	At least 80% of the teams will score 2.5 or higher on the associated rubric	Annually
EGR4082	Student reflection on preparation to design engineering solutions. (all)	Senior Survey (Indirect Method)	80% of the respondents will say that they are satisfied or higher	Annually

Longitudinal Data:
Note that the PHE department changed assessment processes to align with ABET expectations for engineering curriculum. The data shown is all that we are expected to collect for ABET, both formative and summative data. The italicized data is from our previous assessment system.

EGR4072 (Summative)	Percent of Students Above 2.5					
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Student design teams will be able to successfully implement an engineering design process to identify a feasible solution to a problem.	33%	30%	70%	100%	100%	N/A
Student design teams will be able to describe the constraints that impact the engineering solution to a problem. Constraints should include the technical as well as considering public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.	33%	50%	70%	100%	100%	100%
Student design teams will be able to build a budget for the project and discuss financial limitations.	78%	30%	80%	100%	100%	100%

EGR4082 (Summative)	Percent of Students Above 2.5					
	2019-20*	2020-21*	2021-22	2022-23	2023-24	2024-25
Student design teams will be able to construct a prototype of their solution and evaluate its effectiveness.	67%	40%	67%	83%	100%	100%

*Covid Impacted students' ability to create prototypes

Note that these assessments are based on senior design projects and the 2019-20 and 2020-21 academic years had some challenges with students accessing labs and workspaces to complete their projects.

EGR4082 (Student Survey)	Percentage of Students Indicating Satisfied or Higher		
	2022-23	2023-24	2024-25
How well do you feel that you have been prepared to: [Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors?]	67%	100%	71%

Previous Learning Outcome: Students will design and conduct experiments or complete engineering design projects as well as analyze and interpret data.

Previous Outcome Measure: Assessment of design as part of EGR/PHY4082 Senior Project.

Previous Criteria for Success: At least 75% of students will achieve an average score of 2.5 or higher on criteria described in experimental rubric.

Previous Data:

	Percentage of Students scoring 2.5 or higher									
	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Design Rubric	75%	N/A	88%	93%	89%	86%	100%	69%	80%	78%

**Note that 2019-20 and 2020-21 were COVID years.*

Conclusions Drawn from Data:
As we have made our expectations clearer, particularly as it applies to documenting design thinking in their senior projects, the students' scores have attained our benchmark. We also saw some challenges in design work and carrying out designs during the pandemic due to students not having access to our labs or equipment. The 2022-23 and 2024-25 student surveys indicate that some students would like to be better prepared in design thinking (though in both cases this was a relatively small sample so a single student changing their answer would have had this result above the threshold).

Changes to be Made Based on Data:
The department has added more design thinking into existing courses and is adding an additional course on design and applications to the Mechanical Engineering curriculum (there were more design-related courses in the other two concentrations). This class will first be taught in the 2025-26 academic year.

Rubric:
EGR4072 and EGR4082 – There is no rubric since it comes from the review sheet of the faculty and external professional review committee.
Senior Survey – No rubric for this since they are survey results.

Physics and Engineering

Learning Outcome: ABET #3: Students will demonstrate an ability to communicate effectively with a range of audiences.

- Students will be able to speak about their work with precision, clarity and organization. (CC: OC)
- Students will be able to write about their work with precision, clarity and organization. (CC: WC)
- Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand. (CC: IL)

Outcome Measures and Criteria for Success:

Course	Outcome Assessed	Assessment Method	Threshold	Frequency
EGR2024L	Students will be able to write a lab report that accurately summarizes the experiment and the results.	Lab Report	At least 80% of the students will score 2.5 or higher on the associated rubric	Annually
PHY3004L	Students will be able to write a lab report that accurately summarizes the experiment and the results.	Lab Report	At least 80% of the students will score 2.5 or higher on the associated rubric	Alternating Year
EGR3093L	Students will be able to write a lab report that accurately summarizes the experiment and the results.	Lab Report	At least 80% of the students will score 2.5 or higher on the associated rubric	Alternating Year
EGR4082	Students will be able to speak about their work with precision, clarity and organization.	Faculty Team Assessment of Final Project Presentation	At least 80% of the teams will score 2.5 or higher on the associated rubric	Annually
EGR4082	Students will be able to write about their work with precision, clarity and organization.	Faculty Team Assessment of Final Project Report	At least 80% of the teams will score 2.5 or higher on the associated rubric	Annually
EGR4082	Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand.	Faculty Team Assessment of Final Project Report	At least 80% of the teams will score 2.5 or higher on the associated rubric	Annually
EGR4082	Student reflection on preparation to communicate effectively	Senior Survey (Indirect Method)	80% of the respondents will say that they are satisfied or higher	Annually

Longitudinal Data:

Note that the PHE department changed assessment processes to align with ABET expectations for engineering curriculum. The data shown is all that we are expected to collect for ABET, both formative and summative data, so some formative data has been added as well as some additional data gathered from laboratory reports.

EGR2024 (Formative)

Percent of Students Above 2.5					
2019-20	2020-21	2021-22	2022-23	2023-24	2024-25*

Students will be able to write a lab report that accurately summarizes the experiment and the results	0%	33%	56%			100%
Writing is precise, clear, and organized				100%	100%	
Writing accurately summarizes the experiment				100%	100%	
Writing accurately summarizes the main results of the experiment				100%	100%	

* The wrong rubric was used in 2024-25.

PHY3004 (Summative)	Percent of Students Above 2.5					
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Students will be able to write a lab report that accurately summarizes the experiment and the results	60%	100%	63%	100%	100%	100%

EGR3093 (Summative)	Percent of Students Above 2.5					
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Students will be able to write a lab report that accurately summarizes the experiment and the results	100%	N/A	100%	N/A	60%	N/A

EGR4082 - Speaking (Summative)	Percentage of Students at 2.5 or Higher						
	2018-19	2019-20*	2020-21*	2021-22	2022-23	2023-24	2024-25
Students will be able to speak about their work with precision, clarity and organization. (CC: OC)	75%	100%	88%	100%	100%	100%	100%

EGR4082 - Writing (Summative)	Percentage of Students at 2.5 or Higher						
	2018-19	2019-20*	2020-21*	2021-22	2022-23	2023-24	2024-25
Students will be able to write about their work with precision, clarity and organization. (CC: WC)	100%	No Data	80%	67%	100%	100%	0%

EGR4082 - Information Literacy (Summative)	Percentage of Students at 2.5 or Higher						
	2018-19	2019-20*	2020-21*	2021-22	2022-23	2023-24	2024-25

Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand. (CC: IL)	44%	No Data	80%	100%	83%	0%	0%

* Indicates a COVID year

EGR4082 (Student Survey)	Percentage of Students Indicating Satisfied or Higher		
	2022-23	2023-24	2025-25
How well do you feel that you have been prepared to: [Communicate truthfully and effectively?]	100%	90%	71%
How well do you feel that you have been prepared to: [Communicate orally?]	83%	100%	71%
How well do you feel that you have been prepared to: [Communicate in writing?]	100%	100%	71%

Conclusions Drawn from Data:
The students are generally meeting our benchmarks. We have seen improvement in the results with the lab reports as we have made our expectations clearer. The drop in the 2023-24 lab assessment for EGR3093 was a matter of a single student missing the benchmark. We are seeing mixed results with information literacy. In 2024-25 all of the students missed the benchmark in both writing and information literacy. These scores were based on a single team report. If we had set the benchmark at scores of 2 or higher, 100% of the students would have met the benchmark. As with other data from the senor survey, if a single student had scored communication areas one point higher, we would have met the benchmark.

Changes to be Made Based on Data:
Continue to monitor progress and emphasize the components of a thorough lab report. Revisit the proper citation of reference material in reports. We are also revising how we handle writing in EGR4082 so that we can collect samples of individual students' writing.

Rubrics:
EGR2024 - attached
PHY3004 - attached
EGR3093 - attached
Oral Presentation - attached
Writing - attached
Information Literacy – This is a subset of the writing rubric.
The senior data comes from a survey and thus has no rubric.

EGR 2024 Assessment Method: Lab Report (Current)

PLO3: Students will demonstrate an ability to communicate effectively with a range of audiences.

- Students will be able to speak about their work with precision, clarity, and organization. (CC: OC)
- Students will be able to write about their work with precision, clarity and organization. (CC: WC)
- Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand. (CC: IL)

Criteria	**4 – Excellent**	**3 – Good**	**2 – Fair**	**1 – Poor**
Writing is precise, clear, and organized	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some ambiguity	Many mistakes, writing is ambiguous and not organized
Writing accurately summarizes the experiment	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some ambiguity	Many mistakes, writing is ambiguous and not organized
Writing accurately summarizes the main results of the experiment	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some ambiguity	Many mistakes, writing is ambiguous and not organized

EGR 2024L Assessment Method: Lab Report (Past)

PLO3: Students will demonstrate an ability to communicate effectively with a range of audiences.

- Students will be able to speak about their work with precision, clarity, and organization. (CC: OC)
- Students will be able to write about their work with precision, clarity and organization. (CC: WC)
- Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand. (CC: IL)

PLO6: Students will demonstrate an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. (CC: QR)

Criteria	4 – Excellent	3 – Good	2 – Fair	1 – Poor
3. Students will be able to write a lab report that accurately summarizes the experiment and the results.	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some ambiguity	Many mistakes, writing is ambiguous and not organized
6. Students will be able to carry out an experiment based on instructions and accurately record data.	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some ambiguity	Many mistakes, writing is ambiguous and not organized
6. Students will be able to analyze experimental data and draw conclusions.	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some ambiguity	Many mistakes, writing is ambiguous and not organized

PHY 3004L Assessment Method: Lab Report

PLO3: Students will demonstrate an ability to communicate effectively with a range of audiences.

- Students will be able to speak about their work with precision, clarity, and organization. (CC: OC)
- Students will be able to write about their work with precision, clarity and organization. (CC: WC)
- Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand. (CC: IL)

PLO6: Students will demonstrate an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. (CC: QR)

Criteria	**4 – Excellent**	**3 – Good**	**2 – Fair**	**1 – Poor**
3. Students will be able to write a lab report that accurately summarizes the experiment and the results.	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some ambiguity	Many mistakes, writing is ambiguous and not organized
6. Students will be able to compare experimental results to appropriate theoretical models and explain differences, including quantifying sources of error.	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some ambiguity	Many mistakes, writing is ambiguous and not organized

EGR 3093L Assessment Method: Lab Report

PLO3: Students will demonstrate an ability to communicate effectively with a range of audiences.

- Students will be able to speak about their work with precision, clarity, and organization. (CC: OC)
- Students will be able to write about their work with precision, clarity and organization. (CC: WC)
- Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand. (CC: IL)

PLO6: Students will demonstrate an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. (CC: QR)

Criteria	**4 – Excellent**	**3 – Good**	**2 – Fair**	**1 – Poor**
3. Students will be able to write a lab report that accurately summarizes the experiment and the results.	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some ambiguity	Many mistakes, writing is ambiguous and not organized
6. Students will be able to compare experimental results to appropriate theoretical models and explain differences, including quantifying sources of error.	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some ambiguity	Many mistakes, writing is ambiguous and not organized

PHY-ENG Oral Presentation Rubric Update

Criteria	Outstanding	High Satisfactory	Low Satisfactory	Unsatisfactory
Command of material	☐ Clearly knows material	☐ Knows most key facts	☐ Reads some, knows some	☐ Reads many sentences from slides
	☐ Expands on PowerPoint slides	☐ Some expansion on slides	☐ No expansion on slides	☐ Dependent on notes
	☐ Content appropriate for audience	☐ Partial adaptation for audience	☐ Little adaptation of content for audience	☐ Lacks adaptation of content to audience
Organization	☐ Clear and concise outline	☐ Clear outline	☐ Some sense of outline	☐ No clear sense of outline
	☐ Relevant graphics and key text items on slides	☐ Too much information on slides (not concise)	☐ Too much information and detail	☐ Slides are in paragraphs; too much detailed information on one slide
	☐ Plus/minus 30 seconds of time limit	☐ Plus/minus 60 seconds of time limit	☐ Plus/minus 1.5 minutes of time limit	☐ Plus/minus 2 minutes of time limit
Presentation skills	☐ Clearly has practiced several times; smooth transitions	☐ Practiced, but transitions are not smooth	☐ Practiced, but no transitions between slides	☐ Not practiced, doesn't anticipate content of next slide
	☐ Free of uhms and the like	☐ Few uhms and the like	☐ Many uhms and the like	☐ Uhms and the like detract from the presentation
	☐ Clearly heard and used inflection for emphasis	☐ Understood much of the time and some inflection	☐ Some difficulty hearing and little inflection	☐ Cannot be heard and/or speaks in a monotone
	☐ Engages audience with eye contact	☐ Some engagement with eye contact	☐ Infrequent eye contact	☐ No eye contact
	☐ Engages audience with gestures	☐ Some engagement with gestures	☐ Some distracting gestures	☐ Frequent distracting gestures
Presentation tools	☐ PPT background is matched to content, legible font, graphics, seamless transitions	☐ Appropriate background, font, transitions	☐ Distracting backgrounds, transitions, fonts hard to read	☐ No attention to backgrounds, transitions, fonts very hard to read
	☐ Appropriate graphics used	☐ Some graphics used to enhance presentation	☐ Graphics do not enhance presentation	☐ Distracting use of graphics

PHY-ENG Written Presentation Rubric

Criteria	Outstanding	High Satisfactory	Low Satisfactory	Unsatisfactory
Structural pieces	☐ Abstract is a clear and concise summary of all relevant results and descriptions in the order emphasized in the paper	☐ Abstract could be made clear and/or concise with minor changes	☐ Abstract is missing some information and/or contains unnecessary information	☐ Abstract does not contain necessary information
	☐ Introduction indicates precise subject, scope, and purpose	☐ Introduction is missing one of the following: precise subject, scope or purpose	☐ Introduction is missing two of the following: precise subject, scope or purpose	☐ Introduction does not give precise subject, scope and purpose
	☐ Main body is well organized, logical and contains all necessary information without extra information	☐ Main body lacks some organization	☐ Main body is missing some important pieces and/or is not well organized	☐ Main body is not well organized, lacks logical arguments and relevant data
	☐ Conclusion appropriately sums up, gives conclusions, and recommendations	☐ Conclusion does two of the following: sums up, gives conclusions, and recommendations	☐ Conclusion does one of the following: sums up, gives conclusions, and recommendations	☐ Conclusion does not provide any summation, conclusions, or recommendations
	☐ Multiple references from reputable sources	☐ Most references from distinct reputable sources	☐ Some references from reputable sources	☐ No bibliography or all references from untrusted sources
	☐ References cited in the body of the document	☐ Some citations of reference in the body	☐ Limited citation references	☐ No citation of references
Data	☐ Data is clearly presented in properly formatted tables, figures and graphs where appropriate	☐ Some data could be presented more clearly	☐ Data is poorly presented and some key data is missing	☐ Several pieces of key data are missing
	☐ All uncertainties are shown and error propagation is carried out where appropriate	☐ Most uncertainties are shown and propagation of error carried out	☐ Many uncertainties are missing and/or propagation or error not carried out correctly	☐ No uncertainties of measurements are shown
Grammar, spelling and style	☐ No grammatical or spelling errors	☐ Few grammatical and spelling errors	☐ Some grammatical and spelling errors	☐ Many grammatical and spelling errors
	☐ Equations well formatted and variables introduced as needed	☐ A few errors in formatting equations	☐ Poorly formatted equations	☐ Incorrect equations
	☐ Appropriate style (no first-person, past tense when reporting was done)	☐ A few informal statements and/or tense	☐ Several areas which are too informal and tense errors	☐ Very informal and/or use of future tense where not appropriate
	☐ Clear sentences and ideas are presented in a way that won't be misunderstood	☐ A few unclear sentences	☐ Many complex and unclear sentences	☐ Many sentences are unclear and have overly complex construction
	☐ Concise and quantitative as subject matter permits	☐ A few unnecessary words and ideas	☐ Frequent extra and inexact words	☐ Many vague, inexact, and/or idle words
	☐ Arguments are complete and logical	☐ Most arguments are complete	☐ Several arguments are difficult to follow	☐ Arguments are incomplete, illogical, and may contain unnecessary information and specialized jargon

Physics and Engineering

Learning Outcome: ABET #4: Students will demonstrate an ability to recognize ethical and professional responsibilities and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

Outcome Measures and Criteria for Success:

Course	Outcome Assessed	Assessment Method	Threshold	Frequency
EGR1023 EGR1023L	Students will be able to determine an ethical response to a hypothetical engineering problem, acknowledging the impact of their solutions in the context of the problem (global, economic, environmental, societal),	Homework Assignment or Exam Question	At least 80% of the students will score 2.5 or higher on the associated rubric	Annually
EGR2014 EGR2014L	Students will be able to determine an ethical response to a hypothetical engineering problem, acknowledging the impact of their solutions in the context of the problem (global, economic, environmental, societal).	Homework Assignment or Exam Question	At least 80% of the students will score 2.5 or higher on the associated rubric	Annually
EGR4082	Students will be able to describe the role of engineering ethics, professional responsibility and the impact of contexts in their project.	Faculty/Review Team Assessment of Final Project	At least 80% of the teams will score 2.5 or higher on the associated rubric	Annually
EGR4082	Student reflection on preparation to recognize ethical and professional responsibilities and make informed judgements.	Senior Survey (Indirect Method)	80% of the respondents will say that they are satisfied or higher	Annually
EGR4092	Students will be able to determine an ethical response to a hypothetical engineering problem, acknowledging the impact of their solutions in the context of the problem (global, economic, environmental, societal) (all)	Application of a code of ethics to situation in their internship	At least 80% of the students will score 2.5 or higher on the associated rubric	Anually

Longitudinal Data:
Note that the PHE department changed assessment processes to align with ABET expectations for engineering curriculum. The data shown is all that we are expected to collect for ABET, both formative and summative data. Specifically assessing ethical considerations is new for the department and we have been building a set of modules on ethics to be placed throughout the curriculum. 2022-23 was the first year of using these modules.

EGR1023 (Formative)	Percentage of Students With Average 2.5 or Above		
	2022-23	2023-24	2024-25
Can identify an ethical issue in a problem or scenario.	71%	67%	73%
Can apply an ethical framework to ethical issue (virtue, utilitarianism, deontology, analogies) to scenario.	64%	50%	77%
Can make and support plausible ethical decision(s).	71%	50%	73%

EGR2014 (Formative)	Percentage of Students With Average 2.5 or Above		
	2022-23	2023-24	2024-25
Can identify an ethical issue in a problem or scenario.	83%	100%	100%
Can apply an ethical framework to ethical issue (virtue, utilitarianism, deontology, analogies) to scenario.	83%	89%	93%
Can make and support plausible ethical decision(s).	83%	89%	86%

EGR4082 (Summative)	Percentage of Students With Average 2.5 or Above		
	2022-23	2023-24	2024-25
Students will be able to describe the role of engineering ethics, professional responsibility, and their impact of contexts in their project.	83%	100%	100%

EGR4082 (Student Survey)	Percentage of Students Indicating Satisfied or Higher		
	2022-23	2023-24	2024-25
How well do you feel that you have been prepared to: [Recognize ethical and professional responsibilities in engineering?]	100%	90%	57%
How well do you feel that you have been prepared to: [Make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts?]	83%	100%	86%

EGR4092 (Summative) - Previously EGR4072	Percentage of Students With Average 2.5 or Above		
	2022-23	2023-24	2024-25
Can identify an ethical issue in a problem or scenario.	100%	100%	33%
Can apply an ethical framework to ethical issue (virtue, utilitarianism, deontology, analogies) to scenario.	50%	100%	0%
Can make and support plausible ethical decision(s).	100%	89%	50%

Conclusions Drawn from Data:

The freshman students are not meeting our benchmark in our formative assessment. But in general scores improve in later years. The advisory board believes that they are meeting the mark (EGR4082 scores), but the student's self-assessment is lower. The students did not do well in identifying ethical issues in their internships in 2024-25.

Changes to be Made Based on Data:
Continue to introduce modules on ethics in engineering classes and monitor progress. Review assignment in EGR4092 and see if it needs to be revised to clarify expectations.

Rubric:
EGR1023/EGR2014/EGR3023/EGR4072 - See the next page for the rubric used in all classes.
EGR4082 – There is no rubric since it comes from the review sheet of the faculty and external professional review committee.
Senior Survey – No rubric for this since they are survey results.

Ethics Rubric

	Unsatisfactory (1)	Satisfactory (2)	Good (3)	Excellent (4)
Can identify an ethical issue in a problem or scenario. (Ethical Issue Recognition)	Student is unable to identify the core ethical issue of the scenario.	Student identifies a concern of the scenario, but not a core ethical issue.	Student identifies a core ethical issue, but not a secondary concern.	Student identifies a core ethical issue along with secondary concerns.
Can apply an ethical framework to an ethical issue (virtue, utilitarianism, deontology, analogies) to scenario. (Application of Ethical Perspectives/Concepts)	Student is unable to state an ethical framework.	Student states an ethical framework and makes an attempt to apply it to the scenario.	Student states an ethical framework and is mostly correct in applying it to the scenario.	Student states an ethical framework and can correctly apply it to the scenario.
Can make and support plausible ethical decision(s). (Informed Judgement)	Student is unable to form and support a plausible ethical decision.	Student forms a plausible ethical decision, however no support is given.	Student forms a plausible ethical decision and provides minimum support.	Student forms a plausible ethical decision and provides strong support.

Physics and Engineering

Learning Outcome: ABET #5: Students will demonstrate an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

Outcome Measures and Criteria for Success:

Course	Outcome Assessed	Assessment Method	Threshold	Frequency
EGR1023 EGR1023L	Students will demonstrate an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Homework Assignment to Complete Evaluation of Each Team Member	At least 80% of the students will score 2.5 or higher on the associated rubric	Annually
PHY3004 PHY3004L	Students will demonstrate an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Homework Assignment to Complete Evaluation of Each Team Member	At least 80% of the students will score 2.5 or higher on the associated rubric	Annually
EGR4042 EGR4042L	Students will demonstrate an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Homework Assignment to Complete Evaluation of Each Team Member	At least 80% of the students will score 2.5 or higher on the associated rubric	Alternating Year
EGR4082	Students will demonstrate an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Homework Assignment to Complete Evaluation of Each Team Member	At least 80% of the students will score 2.5 or higher on the associated rubric	Annually
EGR4082	Student reflection on preparation to be part of a team.	Senior Survey (Indirect Method)	80% of the respondents will say that they are satisfied or higher	Annually

Longitudinal Data:
Note that the PHE department changed assessment processes to align with ABET expectations for engineering curriculum. The data shown is all that we are expected to collect for ABET, both formative and summative data. This is an expansion of the data that we collected previously.

EGR1023 (Formative)	Percent of Students at 2.5 or Higher		
	2022-23	2023-24	2024-25
Focus on Task	100%	100%	100%
Extent to which works together	100%	100%	95%
Meeting habits	100%	100%	95%
Attitude while listening and discussing	100%	100%	100%
Problem solving	100%	100%	86%
Goal completion	100%	100%	100%

PHY3004 (Summative)	Percent of Students at 2.5 or Higher							
	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Teamwork Rubric	91%	86%						
Focus on Task			100%	100%	100%	100%	100%	100%
Extent to which works together			100%	100%	100%	100%	100%	100%
Meeting habits			100%	100%	100%	100%	100%	100%
Attitude while listening and discussing			100%	100%	100%	100%	100%	100%
Problem solving			100%	100%	100%	100%	100%	100%
Goal completion			100%	100%	100%	100%	100%	100%

EGR4042/4043 (Summative) Alternating Year Class	Percent of Students at 2.5 or Higher		
	2022-23	2023-24	2024-25*
Focus on Task	100%	N/A	N/A
Extent to which works together	100%	N/A	N/A
Meeting habits	100%	N/A	N/A
Attitude while listening and discussing	100%	N/A	N/A
Problem solving	100%	N/A	N/A
Goal completion	100%	N/A	N/A

* Assessment missed in 2024-25

EGR4082 (Summative)	Percent of Students at 2.5 or Higher		
	2022-23	2023-24	2024-25
Focus on Task	100%	100%	86%
Extent to which works together	83%	100%	100%
Meeting habits	83%	100%	86%
Attitude while listening and discussing	100%	100%	100%
Problem solving	100%	100%	86%
Goal completion	100%	100%	100%

EGR4082 (Student Survey)	Percentage of Students Indicating Satisfied or Higher		
	2022-23	2023-24	2024-25
How well do you feel that you have been prepared to: [Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives?]	83%	100%	71%

Conclusions Drawn from Data:
Students are meeting the benchmark in this area. The only place where the score was lower was in the student survey (EGR4082) and as mentioned previously, because the sample size is small, if one student has raised their score by one point, the benchmark would have been met.

Changes to be Made Based on Data:
None at this time.

Rubric:
See the next page for the rubric used in all classes.
The senior survey data comes from a survey given to seniors in their final project class.

Physics and Engineering Teamwork Rubric

Criteria	Outstanding	High Satisfactory	Low Satisfactory	Unsatisfactory
Focus on Task	☐ Stays on task all of the time	☐ Stays on task most of the time	☐ Stays on task some of the time with some reminders from group	☐ Hardly ever on task, lets others do task
Extent to which works together	☐ A very strong group member who works hard and helps others in the group	☐ A strong group member who works hard	☐ Sometimes active group member but needs to try harder	☐ Frequently choosing not to help out
Meeting habits	☐ On time to meetings or any assigned tasks	☐ Usually on time and completes any assigned task	☐ Sometimes late for meeting or not completing tasks	☐ Late or absent for many or all meetings
Attitude while listening and discussing	☐ Respectful listener, discusses, and helps direct the group in solving problems	☐ Respectful, listens and asks questions	☐ Has trouble listening with respect and takes over discussions without letting others have a turn	☐ Does not listen or consider other's ideas, blocks group from reaching agreement
Problem solving	☐ Actively seeks and suggests solutions to problems	☐ Improves on solutions and suggestions given by others	☐ Does not offer solutions but is willing to try solutions offered by others	☐ Does not try to solve problems or help others solve problems
Goal completion	☐ Works to complete group goals	☐ Usually helps to complete group goals	☐ Occasionally helps to complete group goals	☐ Does not help to complete group goals

Physics and Engineering

Learning Outcome: ABET #6: Students will demonstrate an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. (CC: QR)

Outcome Measures and Criteria for Success:

Course	Outcome Assessed	Assessment Method	Threshold	Frequency
EGR2024 EGR2024L	Students will be able to carry out an experiment based on instructions and accurately record data.	Lab Report	At least 80% of the students will score 2.5 or higher on the associated rubric	Annually
EGR2024 EGR2024L	Students will be able to analyze experimental data and draw conclusions.	Lab Report	At least 80% of the students will score 2.5 or higher on the associated rubric	Annually
PHY3004 PHY3004L	Students will be able to compare experimental results to appropriate theoretical models and explain differences, including quantifying sources or error.	Lab Report	At least 80% of the students will score 2.5 or higher on the associated rubric	Annually
EGR3053# EGR3053L (2023 and beyond) EGR3093 EGR3093L (old)	Students will be able to compare experimental results to appropriate theoretical models and explain differences, including quantifying sources or error.	Lab Report	At least 80% of the students will score 2.5 or higher on the associated rubric	Alternating Year
EGR4082	Student reflection on preparation to conduct experiments and interpret data.	Senior Survey (Indirect Method)	80% of the respondents will say that they are satisfied or higher	Annually

Longitudinal Data:
Note that the PHE department changed assessment processes to align with ABET expectations for engineering curriculum. This includes both formative and summative data. As can be seen in the data, the measurement/rubric has changed over time.

EGR2024 (Formative)	Percent of Students at 2.5 or Higher					
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Students will be able to carry out an experiment based on instructions and accurately record data	0%	27%	100%			
Students are able to carry out the experiment from instructions				100%	100%	100%
Students will be able to analyze experimental data and draw conclusions	0%	45%	60%	100%	79%	100%

PHY3004 (Summative)	Percent of Students at 2.5 or Higher					
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Students will be able to compare experimental results to appropriate theoretical models and explain differences, including quantifying sources of error	40%	100%	63%	100%	50%	75%

EGR3053 (Summative)	Percent of Students at 2.5 or Higher					
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Students are able to follow instructions					100%	N/A
Students are able to carry out the experiment from instructions					100%	N/A
Data is accurately recorded					100%	N/A
Students will be able to compare experimental results to appropriate theoretical models and explain differences, including quantifying sources of error	100%		100%			

*changed to EGR3053 in 2023-24 and rubric modified - previously it was EGR3093

EGR4082 (Student Survey)	Percentage of Students Indicating Satisfied or Higher		
	2022-23	2023-24	2024-25
How well do you feel that you have been prepared to: [Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions?]	83%	100%	57%

Conclusions Drawn from Data:
The students are generally meeting our benchmarks at the summative level. The drop in PHY3004 in 2023-24 and 2024-25 is due to 1-2 teams writing sub-par reports. One of the things that we have identified this year is that students are struggling with designing testing plans for their senior projects. This seems to be reflected in the student survey data.

Changes to be Made Based on Data:
Continue to monitor student progress and review the lab results for PHY3004. We are also making changes in when students are required to take statistics in the program and will make it a pre-requisite for the senior project classes. We are also going to incorporate the design of testing plan into student projects earlier in the curriculum and we are considering creating a statistics for engineers course that we will be able to populate as the program grows.

Rubrics:
EGR2024: The rubrics for both assessments are attached (the two current rubrics as well as the historical one are included).
PHY3004: Rubric is attached.
EGR3093: Rubric is attached.
EGR4082: This is data from a survey given to seniors.

EGR 2024 and 2024L Assessment Method: Lab Report (Current)

PLO6: Students will demonstrate an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. (CC: QR)

Criteria	**4 – Excellent**	**3 – Good**	**2 – Fair**	**1 – Poor**
Students are able to follow instructions	No mistakes	Few mistakes, mostly follows instructions	Some mistakes, some confusion following instructions	Many mistakes, clearly does not follow instructions
Students are able to carry out the experiment from instructions	No mistakes	Few mistakes, mostly correct experimental setup	Some mistakes, some confusion with experimental setup	Many mistakes, wrong experimental setup
Data is accurately recorded	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some confusion with data	Many mistakes, data is not organized or labeled properly

EGR 2024 and 2024L Assessment Method: Lab Report (Current)

PLO6: Students will demonstrate an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. (CC: QR)

Criteria	4 – Excellent	3 – Good	2 – Fair	1 – Poor
Analyze experimental data	Arrives at significant results of the experiment from data and identifies key features in data	Arrives at significant results of the experiment from data	Arrives at some of the significant results of the experiment from data	Does not analyze data or incorrectly analyzes data
Draw conclusions from data	Significant conclusions of the experiment are stated and further inferences are made from data	Significant conclusions of the experiment are stated	Some Significant conclusions of the experiment are stated	No conclusions stated or inaccurate conclusions from data

EGR 2024L Assessment Method: Lab Report (Past)

PLO3: Students will demonstrate an ability to communicate effectively with a range of audiences.

- Students will be able to speak about their work with precision, clarity, and organization. (CC: OC)
- Students will be able to write about their work with precision, clarity and organization. (CC: WC)
- Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand. (CC: IL)

PLO6: Students will demonstrate an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. (CC: QR)

Criteria	**4 – Excellent**	**3 – Good**	**2 – Fair**	**1 – Poor**
3. Students will be able to write a lab report that accurately summarizes the experiment and the results.	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some ambiguity	Many mistakes, writing is ambiguous and not organized
6. Students will be able to carry out an experiment based on instructions and accurately record data.	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some ambiguity	Many mistakes, writing is ambiguous and not organized
6. Students will be able to analyze experimental data and draw conclusions.	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some ambiguity	Many mistakes, writing is ambiguous and not organized

PHY 3004L Assessment Method: Lab Report

PLO3: Students will demonstrate an ability to communicate effectively with a range of audiences.

- Students will be able to speak about their work with precision, clarity, and organization. (CC: OC)
- Students will be able to write about their work with precision, clarity and organization. (CC: WC)
- Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand. (CC: IL)

PLO6: Students will demonstrate an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. (CC: QR)

Criteria	**4 – Excellent**	**3 – Good**	**2 – Fair**	**1 – Poor**
3. Students will be able to write a lab report that accurately summarizes the experiment and the results.	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some ambiguity	Many mistakes, writing is ambiguous and not organized
6. Students will be able to compare experimental results to appropriate theoretical models and explain differences, including quantifying sources of error.	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some ambiguity	Many mistakes, writing is ambiguous and not organized

EGR 3053L Assessment Method: Lab Report

PLO3: Students will demonstrate an ability to communicate effectively with a range of audiences

- Students will be able to speak about their work with precision, clarity, and organization. (CC: OC)
- Students will be able to write about their work with precision, clarity and organization. (CC: WC)
- Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand. (CC: IL)

PLO6: Students will demonstrate an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. (CC: QR)

Criteria	**4 – Excellent**	**3 – Good**	**2 – Fair**	**1 – Poor**
6. Students will be able to compare experimental results to appropriate theoretical models and explain differences, including quantifying sources of error.	No mistakes	Few mistakes, mostly clear and organized	Some mistakes, some ambiguity	Many mistakes, writing is ambiguous and not organized

Physics and Engineering

Learning Outcome: ABET #7: Students will demonstrate an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Outcome Measures and Criteria for Success:

Course	Outcome Assessed	Assessment Method	Threshold	Frequency
EGR1023 EGR1023L	Students will be able to analyze the quality of information found using an online search.	Homework Assignment	At least 80% of the students will score 2.5 or higher on the associated rubric	Annually
EGR4072	Students will be able to acquire and use knowledge not in a textbook for the development of their project.	Faculty/Review Team Assessment of Project Proposal	At least 80% of the teams will score 2.5 or higher on the associated rubric	Annually
EGR4082	Student reflection on preparation to acquire and apply new knowledge.	Senior Survey (Indirect Method)	80% of the respondents will say that they are satisfied or higher	Annually

Longitudinal Data:
Note that the PHE department changed assessment processes to align with ABET expectations for engineering curriculum. This includes the collection of both formative and summative data which is included here.

EGR1023 (Formative)	Percent of Students at 2.5 or Higher		
	2022-23	2023-24	2024-25
Students will be able to analyze the quality of information found using an online search.	79%	100%	75%

EGR4072 (Summative)	Percent of Students at 2.5 or Higher					
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Students will be able to acquire and use knowledge not in a textbook for the development of their project.	54%	40%	91%	100%	100%	100%

EGR4082 (Student Survey)	Percentage of Students Indicating Satisfied or Higher		
	2022-23	2023-24	2024-25
How well do you feel that you have been prepared to: [Acquire and apply new knowledge as needed, using appropriate learning strategies.]	N/A	100%	86%

Conclusions Drawn from Data:
Our students are meeting our benchmark at the summative level. The improvement in scores in EGR4072 Senior Project I can be attributed to our shift to making it clearer how students will demonstrate this competency.

Changes to be Made Based on Data:
None. Continue to monitor progress.

Rubrics:
EGR1023 (see attached)
EGR4072 – This is one component of the survey used by the group of faculty and working professionals who review students' projects.
EGR4082 – This data will come from an exit survey given to seniors. This question was not asked in the 2022-23 survey but has been added for the 2023-24 survey.

EGR 1023 Assessment Method: Homework Assignment

PLO7: Students will demonstrate an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Outcome Assessed	Excellent (4)	Good (3)	Fair (2)	Poor (1)
Students will be able to analyze the quality of information found using an online search.	The student clearly and accurately differentiated between high-quality and low-quality information.	The student made one small error in discerning the quality of the information.	The student struggled with discerning the quality of the information.	The student is unable to differentiate between high-quality and low-quality information.

Physics and Engineering Teamwork Rubric

(PHY3004L)

Criteria	Outstanding	High Satisfactory	Low Satisfactory	Unsatisfactory
Focus on Task	☐ Stays on task all of the time	☐ Stays on task most of the time	☐ Stays on task some of the time with some reminders from group	☐ Hardly ever on task, lets others do task
Extent to which works together	☐ A very strong group member who works hard and helps others in the group	☐ A strong group member who works hard	☐ Sometimes active group member but needs to try harder	☐ Frequently choosing not to help out
Meeting habits	☐ On time to meetings or any assigned tasks	☐ Usually on time and completes any assigned task	☐ Sometimes late for meeting or not completing tasks	☐ Late or absent for many or all meetings
Attitude while listening and discussing	☐ Respectful listener, discusses, and helps direct the group in solving problems	☐ Respectful, listens and asks questions	☐ Has trouble listening with respect and takes over discussions without letting others have a turn	☐ Does not listen or consider other's ideas, blocks group from reaching agreement
Problem solving	☐ Actively seeks and suggests solutions to problems	☐ Improves on solutions and suggestions given by others	☐ Does not offer solutions but is willing to try solutions offered by others	☐ Does not try to solve problems or help others solve problems
Goal completion	☐ Works to complete group goals	☐ Usually helps to complete group goals	☐ Occasionally helps to complete group goals	☐ Does not help to complete group goals