#### **Physics Assessment Plan**

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

Course	Outcome Assessed	Assessment Method	Threshold	Frequency
EGR2014	Students will be able to set up a	Exam Question	At least 80% of the students	Annually
EGR2014L	problem with the appropriate		will score 2.5 or higher on	
	variables and solve the problem		the associated rubric	
EGR2024	Students will be able to set up a	Exam Question	At least 80% of the students	Annually
EGR2024L	problem with the appropriate		will score 2.5 or higher on	
	variables and solve the problem		the associated rubric	
PHY4063	Students will be able to set up a	Exam Question	At least 80% of the students	Alternating
	problem with the appropriate		will score 2.5 or higher on	Year
	variables and solve the problem		the associated rubric	
PHY2044	Students will be able to set up a	Exam Question	At least 80% of the students	Annually
	problem with the appropriate		will score 2.5 or higher on	
	variables		the associated rubric	
	and solve the problem			

2. Students will demonstrate 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.

Course	Outcome Assessed	Assessment Method	Threshold	Frequency
EGR1023 EGR1023L	Student design teams will be able to successfully implement the engineering design process to identify a feasible solution to a problem	Faculty Team Assessment of Final Project (Open House Demo)	At least 80% of the teams will score 2.5 or higher on the associated rubric	Annually
EGR2024 EGR2024L	Student design teams will be able to successfully implement an engineering design process that addresses real problems for existing communities. 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 Team Assessment of Final Project (Open House Demo)	At least 80% of the teams will score 2.5 or higher on the associated rubric	Annually
PHY4072	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
PHY4072	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

PHY4072	Student design teams will be able to	Faculty/Review Team	At least 80% of the teams	Annually
	build a budget for the project and	Assessment of Project	will score 2.5 or higher on	
	discuss financial limitations	Proposal	the associated rubric	

- 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)

Course	Outcome Assessed	Assessment Method	Threshold	Frequency
EGR2014	(WC)	Lab Report	At least 80% of the students	Annually
EGR2014L	Students will be able to write a lab		will score 2.5 or higher on	
	report that accurately summarizes the		the associated rubric	
	experiment and the results			
EGR2024	(IL)	Final Report	At least 80% of the students	Annually
EGR2024L	Students will be able to appropriately		will score 2.5 or higher on	
	identify, locate, evaluate, and		the associated rubric	
	effectively and responsibly use and			
	cite information for the final project			
EGR2024	(WC)	Final Report	At least 80% of the students	Annually
EGR2024L	Students will be able to write a report		will score 2.5 or higher on	
	with appropriate figures, tables,		the associated rubric	
	equations, and formatting			
PHY4082	(OC)	Faculty Team Assessment	At least 80% of the teams	Annually
	Students will be able to speak about	of Final Project	will score 2.5 or higher on	
	their work with precision, clarity and	Presentation	the associated rubric	
	organization			
PHY4082	(WC)	Faculty Team Assessment	At least 80% of the teams	Annually
	Students will be able to write about	of Final Project Report	will score 2.5 or higher on	
	their work with precision, clarity and		the associated rubric	
	organization			
PHY4082	(IL)	Faculty Team Assessment	At least 80% of the teams	Annually
	Students will be able to identify,	of Final Project Report	will score 2.5 or higher on	
	locate, evaluate, and effectively and		the associated rubric	

	responsibly use and cite information for the task at hand			
PHY4082	Student reflection on preparation to communicate effectively	Senior Survey (Indirect Method)	80% of the respondents will say that they are satisfied or higher	Annually

# 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

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
EGR2024 EGR2024L	Students will be able to discuss the impact of their proposed solution to an engineering problem, considering global, economic, environmental, and societal contexts	Homework Assignment	At least 80% of the students will score 2.5 or higher on the associated rubric	Annually
PHY4072	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 Proposal	At least 80% of the teams will score 2.5 or higher on the associated rubric	Annually
PHY4082	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

## 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

Course	Outcome Assessed	Assessment	Threshold	Frequency
		Method		
EGR1023	Students will demonstrate an ability to	Homework	At least 80% of the	Annually
EGR1023L	function effectively on a team whose members	Assignment to	students will score 2.5 or	
	together provide leadership, create a	Complete	higher on the associated	
	collaborative and inclusive environment,	Evaluation of Each	rubric	
	establish goals, plan tasks, and meet objectives	Team Member		
PHY4072	Students will demonstrate an ability to function	Homework	At least 80% of the	Annually
	effectively on a team whose members together	Assignment to	students will score 2.5 or	
	provide leadership, create a collaborative and	Complete	higher on the associated	
	inclusive environment, establish goals, plan	Evaluation of Each	rubric	
	tasks, and meet objectives	Team Member		
PHY4082	Students will demonstrate an ability to	Homework	At least 80% of the	Annually
	function effectively on a team whose members	Assignment to	students will score 2.5 or	
	together provide leadership, create a	Complete	higher on the associated	
	collaborative and inclusive environment,	Evaluation of Each	rubric	
	establish goals, plan tasks, and meet objectives	Team Member		
PHY4082	Student reflection on preparation to be part of	Senior Survey	80% of the respondents	Annually
	a team	(Indirect Method)	will say that they are	
			satisfied or higher	

### 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)

Course	Outcome Assessed	Assessment Method	Threshold	Frequency
EGR2014	Students will be able to carry out an	Procedures Document	At least 80% of the students	Annually
EGR2014L	experiment based on instructions and		will score 2.5 or higher on	
	accurately record data		the associated rubric	
EGR2014	Students will be able to analyze	Lab Report	At least 80% of the students	Annually
EGR2014L	experimental data and draw		will score 2.5 or higher on	
	conclusions		the associated rubric	
PHY4082	Student reflection on preparation to	Senior Survey (Indirect	80% of the respondents will	Annually
	conduct experiments and interpret	Method)	say that they are satisfied or	
	data		higher	

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

Course	Outcome Assessed	Assessment Method	Threshold	Frequency
EGR1023	Students will be able to acquire and	Homework Assignment	At least 80% of the students	Annually
EGR1023L	use knowledge not in a textbook for		will score 2.5 or higher on	
	the development of their project		the associated rubric	
PHY3083	Students will be able to acquire and	Faculty Team Assessment	At least 80% of the students	Alternating
	use knowledge not in a textbook for	of Final Project (Open	will score 2.5 or higher on	Year
	the development of their project	House Demo)	the associated rubric	
PHY4072	Students will be able to acquire and	Faculty/Review Team	At least 80% of the teams	Annually
	use knowledge not in a textbook for	Assessment of Project	will score 2.5 or higher on	
	the development of their project	Proposal	the associated rubric	
PHY4082	Student reflection on preparation to	Senior Survey (Indirect	80% of the respondents will	Annually
	acquire and apply new knowledge	Method)	say that they are satisfied or	
			higher	