Mathematics, Physical Science, and Pre-Engineering AS Degree

9/29/2022

Mission Statement:

The mission of the Mathematics, Physical Science, and Pre-Engineering AS Program at Carl Albert State College is to meet the general education requirements of the college and to provide student with the foundational knowledge and problem solving strategies in the freshman and sophomore sequence of Math, Physical Science and Engineering. The program accomplishes this by providing an introduction to elementary concepts, providing problem solving strategies, and providing experiences in laboratory methods.

Program Goals:

1. Provide graduates the foundational education including theory and practice in related fields of study.
2. Provide graduates with the experiences employing problem solving strategies.
3. Provide graduates with appropriate experience in laboratory techniques and skills.

Program Outcomes:

Upon completion of the program the student will:

1. Apply the Pythagorean Theorem
2. Apply problem solving strategies.
3. Perform safe and appropriate laboratory techniques.

Performance Indicators:

PO 1 Apply the Pythagorean Theorem

1) Solve for various components
2) Recognize relationships between variables
3) Interpret graphical information

PO 2 Apply problem solving strategies.

1) Apply appropriate equation to the problem
2) Choose the correct value for each variable
3) Solve the mathematical equation

PO 3 Perform safe and appropriate laboratory techniques.

1) Apply appropriate personal protective equipment
2) Demonstrate proper laboratory hygiene
3) Demonstrate proper laboratory safety

Rubrics for Evaluation of Performance Indicators:

Program Outcome 1

Performance Indicator	Mastery	Accomplished	Developing	Beginning
PO 1 PI 1 **Solve for various components**	Student was able to solve for all components using Pythagorean theorem	Student was able to solve for all but one components using Pythagorean theorem	Student was able to solve for some various components using Pythagorean theorem	Student was unable to solve for any of the various components using Pythagorean theorem
PO 1 PI 2 **Recognize relationships between variables**	Student was able to choose the correct value of each variable in the problem. They completely understood the variables of Pythagorean theorem.	Student used the right equation but made one incorrect value choice. They did not know the Pythagorean theorem.	Student made more than one incorrect value choice. It may appear they did not know Pythagorean theorem entirely.	Student shows a complete misunderstanding of the relationship of the variables. No understanding of the relationship between variables in Pythagorean theorem.
PO 1 PI 3 **Interpret graphical information**	Student was able to interpret all graphical information presented that regarded the Pythagorean theorem.	Student was unable to interpret one graphical information presented that regarded the Pythagorean theorem.	Student was unable to interpret more than one graphical information presented that regarded the Pythagorean theorem. The student presented a limited knowledge of how graphical information relates.	Student was unable to interpret any graphical information presented that regarded the Pythagorean theorem. The student presented no knowledge of how graphical information relates.

Program Outcome 2

Performance Indicator	Mastery	Accomplished	Developing	Beginning
PO 2 PI 1 **Apply appropriate equation to a problem.**	Student was able to select the appropriate equation and all appropriate variables	Student was able to select the appropriate equation but made some sort of copying error or used one inappropriate variable.	Student selects an equation for particular value of the correct variable to solve for. However it is not the appropriate equation for this problem.	Student selects an inappropriate equation to the problem.
PO 2 PI 2 **Choose the correct value of each variable.**	Student was able to choose the correct value of each variable in the problem.	Student used the right equation but made one incorrect value choice.	Student uses wrong equation for the correct variable and makes incorrect choices for the variables.	Student makes multiple wrong choices for variables.
PO 2 PI 3 **Solve the equation for correct variable.**	Student was able to use correct values for the variable and solve the equation for the correct variable.	Student was able to solve for correct variable but made a minor mathematical error.	Student solves an equation for the correct variable but uses the wrong equation and makes a mathematical error.	Student has incorrect answer due to multiple reasons such as bad algebra/arithmetic and or wrong equation.

Program Outcome 3

Performance Indicator	Mastery	Accomplished	Developing	Beginning
PO 3 PI 1 **Apply Appropriate Personal Protective Equipment (PPE) (PPE includes Goggles, gloves, aprons)**	Never had to remind students to use PPE	Had to remind students only 1 time to use PPE	Had to remind students 2-3 times to use PPE	Had to remind students 4 or more times to use PPE

Note: Not all labs require all PPE to be worn.				
<u>PO 3 PI 2</u> **Demonstrate Proper Laboratory Hygiene** **(Lab Hygiene includes cleanup of lab tables and washing of hands at conclusion of lab)**	Never had to remind students to use good lab hygiene	Had to remind students only 1 time to use good lab hygiene	Had to remind students 2-3 times to use good lab hygiene	Had to remind students 4 or more times to use good lab hygiene
<u>PO 3 PI 3</u> **Demonstrate Proper Laboratory Safety** **(Lab safety includes doing only assigned lab procedures and doing lab procedures in a safe manner)**	Never had to remind students to use proper lab safety	Had to remind students only 1 time to use proper lab safety	Had to remind students 2-3 times to use proper lab safety	Had to remind students 4 or more times to use proper lab safety