Student Learning Outcome (SLO) #2B: Apply scientific and quantitative reasoning to solve problems and increase knowledge.

C2 Analytic Rubric for Quantitative Reasoning

Definition: Quantitative reasoning involves creating sophisticated arguments that are supported by quantitative evidence and communicated clearly using a variety of formats such as words, tables, graphs, mathematical equations, and other quantitative data representations. Mathematics plays an important role in decision-making and problem-solving that require quantitative reasoning, which can involve algebraic, numerical, symbolic, or graphical representations based on logical structures. The use of procedural skills is also an inherent aspect of quantitative reasoning, enabling the generalization and application of results to specific problems or decisions, including those related to the physical and natural world.

This SLO is met by courses falling under *Category C2*: ***Understanding Science and Technology – Quantitative Reasoning*** of the General Education Program at Kutztown University.

Performance Rating Levels

Skill	4 (Excellent)	3 (Good)	2 (Fair)	1 (Poor)
Quantitative Information	Correctly identifies and uses all quantitative information in a given problem and justifies the use of the representations of the information.	Correctly identifies and uses most quantitative information in a given problem.	Correctly identifies and uses some of the quantitative information in a given problem	Provides little or no quantitative information from the stated problem.
Calculation Process	Calculations are entirely successful and sufficiently comprehensive to solve the problem. They are clearly and concisely displayed.	Calculations attempted are mostly successful and sufficiently comprehensive to solve the problem. They are clearly and concisely displayed	Calculations attempted are partially successful, but represent only a portion of the calculations required to solve the problem.	Calculations attempted are both unsuccessful and not comprehensive
Solution	Provides a correct solution or decision with a well-reasoned explanation.	Provides a correct solution or decision, with a partial explanation.	Provides a correct solution or decision, with minimal explanation.	Provides no solution or an incorrect solution not based on the stated problem.

Skill	4 (Excellent)	3 (Good)	2 (Fair)	1 (Poor)
Logical Reasoning	Reasons logically and interprets logical relationships among all problem elements and solutions or decisions.	Reasons logically and interprets logical relationships among most problem elements and solutions or decisions.	Reasons logically and interprets logical relationships among some problem elements and solutions or decisions.	Presents no logical reasoning for a presented solution.
Explanations	Provides well-reasoned, accurate explanations of all information presented in mathematical forms.	Provides well-reasoned, accurate explanations of most information presented in mathematical forms	Provide somewhat reasonable, accurate explanations of some information presented in mathematical forms.	Provides poorly-reasoned, inaccurate explanations of the information presented in mathematical forms
Inferences	Makes all appropriate inferences based on the result. The solution is presented in an effective format.	Makes most appropriate inferences based on the result, though data may be presented in an incomplete format.	Makes some appropriate inferences based on the result, though data may be presented in an incomplete format.	Makes incorrect inferences based on the result or does not provide adequate numerical support.

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