

Core Curriculum Student Learning Outcomes Rubric: KA-B1. Quantitative & Symbolic Reasoning

Rubric Dimensions	Capstone (4)	Milestones (3)	Milestones (3)	Benchmark (1)	No Evidence (0)	Not Applicable (NA)
Interpretation B1:1,3,4,5 Ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words, mathematical models, symbols).	Provides accurate explanations of information presented in mathematical forms. Makes appropriate inferences based on that information.	Provides accurate explanations of information presented in mathematical forms.	Provides somewhat accurate explanations of information presented in mathematical forms.	Attempts to explain information presented in mathematical forms, but draws incorrect conclusions about what the information means.	No Evidence	Not Applicable
Representation B1:1,2,4,5 Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words).	Skillfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding.	Competently converts relevant information into an appropriate and desired mathematical portrayal.	Completes conversion of information but resulting mathematical portrayal is only partially appropriate or accurate.	Completes conversion of information but resulting mathematical portrayal is inappropriate or inaccurate.	No Evidence	Not Applicable
Calculation B1:2,3,4,5	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly (clearly, concisely, etc.)	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem.	Calculations attempted are either unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem.	Calculations are attempted but are both unsuccessful and are not comprehensive.	No Evidence	Not Applicable
Application / Analysis B1:1,2,4,5 Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis.	Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for competent judgments, drawing reasonable and appropriately qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for workmanlike (without inspiration or nuance, ordinary) judgments, drawing plausible conclusions from this work.	Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is hesitant or uncertain about drawing conclusions from this work.	No Evidence	Not Applicable

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Rubric Dimensions	Capstone (4)	Milestones (3)	Milestones (3)	Benchmark (1)	No Evidence (0)	Not Applicable (NA)
Assumptions B1:1,4,5 Ability to make and evaluate important assumptions in estimation, modeling, and data analysis.	Explicitly describes assumptions and provides compelling rationale for why each assumption is appropriate. Shows awareness that confidence in final conclusions is limited by the accuracy of the assumptions.	Explicitly describes assumptions and provides compelling rationale for why assumptions are appropriate.	Explicitly describes assumptions.	Attempts to describe assumptions.	No Evidence	Not Applicable
Communication B1: 3,4,5 Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized)	Uses quantitative information in connection with the argument or purpose of the work, presents it in an effective format, and explicates it with consistently high quality.	Uses quantitative information in connection with the argument or purpose of the work, though data may be presented in a less than completely effective format or some parts of the explication may be uneven.	Uses quantitative information, but does not effectively connect it to the argument or purpose of the work.	Presents an argument for which quantitative evidence is pertinent, but does not provide adequate explicit numerical support.	No Evidence	Not Applicable

This rubric was developed by Core Curriculum Assessment Committee using the MFA core curriculum outcomes for this knowledge area. It is based on the [AAC&U VALUE Rubrics](#). Revised 5/12/2021.

KA-B1. QUANTITATIVE & SYMBOLIC REASONING - LEARNING OUTCOMES

B1.1: Demonstrate number sense. Estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives, and select optimal results. Make appropriate use of technology, being mindful of its limitations when solving problems. (Knowledge and Application)

B1.2: Recognize the behavior of polynomial, rational, radical, exponential, and logarithmic models. Represent the quantitative phenomena in these models using verbal, graphical, tabular and symbolic form. (Knowledge and Application)

B1.3: Solve problems using mathematical (arithmetical, algebraic, geometric, and statistical) methods. (Application and Analysis)

B1.4: Correctly convert, interpret, and analyze different units of measure. (Application and Analysis)

B1.5: Use mathematical models to interpret, hypothesize, and communicate about quantitative phenomena, such as the behavior of drugs in the blood, changes in populations, and fluctuations in prices. (Application and Synthesis)