CSU East Bay ILO Quantitative Reasoning Rubric: Approved by Academic Senate March 19, 2019

Description: Quantitative Reasoning (QR) is competency and comfort in working with numerical data. It involves understanding and applying mathematics/statistics to analyze and interpret real-world quantitative information in a disciplinary context. Individuals with strong QR skills possess the ability to reason about and solve quantitative problems from a wide array of contexts. They understand and can create sophisticated arguments and conclusions supported by quantitative evidence and can clearly communicate those in a variety of formats (using words, tables, graphs, mathematical equations, etc., as appropriate).

	4	**3**	**2**	**1**
Problem Formulation Translation of the disciplinary/real-world problem into a QR context (e.g., writing a hypothesis, a math model, quantitative instrumentation). Use and interpretation of quantitative data/information to identify or formulate a problem.	Formulation of the problem is comprehensive and placed in an appropriate quantitative context.	Formulation of the problem is adequate and placed in an appropriate quantitative context.	Formulation of the problem is limited; explanation of the context is somewhat incorrect or incomplete.	Formulation of the problem is incorrect or missing; explanation of the context is incorrect or incomplete.
Representation/Visualization Depiction of quantitative information such as visual (e.g., figures, charts, tables, equations) and non-visual (e.g., audio, ADA accessible).	Accurate and appropriate display of quantitative information using academic vocabulary with correct symbols, units, scale, etc.	Mostly accurate and appropriate display of quantitative information. May contain minor errors in academic vocabulary, symbols, units, scale, etc.	Somewhat accurate and/or appropriate display of quantitative information. May contain major errors in academic vocabulary, symbols, units, scale, etc.	Inaccurate, inappropriate, or missing display of quantitative information. May contain major errors in academic vocabulary, symbols, units, scale, etc.
Quantitative Analysis Selection and use of analytical methods (e.g., data analysis, solution technique).	Appropriate and accurate selection and use of analytic methods.	Mostly appropriate and accurate selection and use of analytic methods.	Somewhat appropriate and/or somewhat accurate selection and use of analytic methods.	Inappropriate and inaccurate selection and use of analytic methods.

Interpretation Description of the meaning of the results in the context of the original problem formulation.	Appropriate and comprehensive explanation of the results obtained from the quantitative analysis in the context of the original problem.	Mostly appropriate explanation of the results obtained from the quantitative analysis in the context of the original problem.	Somewhat appropriate explanation of the results obtained from the quantitative analysis. Explanation of the context is somewhat incorrect or incomplete.	Inappropriate, inadequate, or missing explanation of the results obtained from the quantitative analysis. Explanation of the context is incorrect or incomplete.
Implications Extension of potential application to broader contexts (e.g., predictive values, future directions, ramifications, clinical prognosis, professional and/or civic responsibilities).	Clearly identifies and explains substantive potential applications of the results and their broader impacts.	Adequately identifies and explains substantive potential applications of the results and their broader impacts.	Unclear or limited explanation of substantive potential applications of the results and their broader impacts.	Inappropriate or missing explanation of substantive potential applications of the results and their broader impacts.
Limitations Acknowledgement of and/or reflection on limitations in interpretation and implication that stem from underlying assumptions, data analysis procedures, methods used, and/or characteristics of the data itself (e.g., sample size, skewed, obvious bias).	Accurate and thorough articulation of deficiencies with the underlying data, analyses or conclusions.	Mostly accurate and/or mostly thorough articulation of deficiencies with the underlying data, analyses or conclusions.	Somewhat inaccurate and/or limited articulation of deficiencies with the underlying data, analyses or conclusions.	Inaccurate or missing articulation of deficiencies with the underlying data, analyses or conclusions.
Overall Communication Following a logical sequence and presenting an				