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| **CSU East Bay ILO Quantitative Reasoning Draft Rubric 2-4-17 Approved for Pilot**  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., ADA accessibility). | 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 of analytical methods (e.g., data analysis, solution technique).  Use of the selected analytical method. | 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. |

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| **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 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**  Follows a logical sequence and presents an explicit chain of reasoning. Uses disciplinary terminology as appropriate. | Consistently clear and logical presentation throughout, using appropriate academic language. | Mostly clear and logical presentation; generally uses appropriate academic language. | Somewhat unclear or illogical presentation; may fail to use appropriate academic language. | Unclear or illogical presentation; fails to use appropriate academic language. |