COLLEGE of CHARLESTON

General Education Assessment
Natural Science Requirement: Student Learning Outcomes

Outcome 1: Students apply physical/natural principles to analyze and solve problems**.**

Evidence: - Students will generate a written document (paper, poster, etc.) in which they:

- Identify the information or data needed to address a particular problem or issue.
- Design or utilize an appropriate discipline-based approach to solve or address the problem.
- Provide an appropriate analysis of data or information, either provided or generated, to make conclusions relative to the original question.

Standard At least 70% of students score 3 or 4 on each dimension for any SLO of rubric.

Outcome 2: Students explain how science impacts society.

Evidence: Students will use discipline-based knowledge or evidence to defend or critique a proposed solution to a science-related societal issue.

Standard At least 70% of students score 3 or 4 on each dimension for any SLO of rubric.

Definitions

Problem solving is the process of designing, evaluating and implementing a strategy to answer an open-ended question or achieve a desired goal and which covers a wide range of activities that may vary significantly across disciplines. In the natural sciences problem solving involves a process of exploring ideas, natural phenomena or works through the collection and analysis of evidence or observations that results in informed conclusions or judgments based on natural science principles. Analysis is the process of breaking complex topics or issues into parts to gain a better understanding of them while being cognizant of the theoretical and methodological limitations inherent to the natural sciences.

Framing Language

Because of methodological/pedagogical limitations in classes which focus in various scientific disciplines an effort has been made to use broad language which reflects multiple approaches and assignments while addressing the fundamental elements of sound inquiry and analysis (including topic selection, existing, knowledge, design, analysis, etc.). The rubric language assumes that the inquiry and analysis process carried out by the student is appropriate for the discipline required. For example, if analysis using statistical methods is appropriate for the discipline then a student would be expected to use an appropriate statistical methodology for that analysis. If a student does not use an appropriate discipline-based process for any criterion, that work should receive a performance rating of "1" or "0" for that criterion.

In addition, this rubric addresses the **products** of analysis and inquiry, not the **processes** themselves. The complexity of inquiry and analysis tasks is determined in part by how much information or guidance is provided to a student and how much the student constructs. The more the student constructs, the more complex the inquiry process. For this reason, faculty are encouraged to adapt the essence and language of each rubric criterion to the disciplinary or interdisciplinary context to which it is applied.

Rubric for Natural Science

Dimension/ Criterion	Does not meet Expectations (1)	Approaches Expectations (2)	Meets Expectations (3)	Exceeds Expectations(4)
Framing a problem: Explain the solving problem process (SLO1)	Demonstrates a limited ability in using discipline-specific language or knowledge to explain analytical methods.	Demonstrates some ability in using discipline-specific language or knowledge to explain analytical methods.	Demonstrates a coherent ability in using discipline-specific language or knowledge to explain analytical methods.	Demonstrates a comprehensive and consistent ability in using discipline-specific language or knowledge to explain analytical methods.
Data Analysis: Use data or evidence to make a conclusion (SLO1)	Evidence or relevant conceptual ideas are presented but is unorganized, poorly presented and/or unrelated to the focus of the problem.	Evidence or relevant conceptual ideas are generally related to the focus of the problem but the use of evidence/ideas is conceptually inaccurate or is not effective at revealing important patterns.	Evidence or relevant conceptual ideas are specifically related to the focus of the problem and the use of evidence/ideas is conceptually accurate or is effective at revealing important patterns.	Evidence or relevant conceptual ideas are specifically related to the focus of the problem and the use of data supports assertions and patterns.
Societal Position: Relate evidence to a societal issue (SLO2)	Unable to develop an opinion from evidence that relates to a societal issue.	Able to develop an opinion from evidence, but does not relate it to a societal issue.	Able to develop an opinion from evidence and relate it to a societal issue.	Able to develop a comprehensive opinion from evidence and relate it to a societal issue with examples.
Impacting Society:Support a position or opinion related to society (SLO2)	Unable to develop a position using rhetoric or evidence from a societal issue.	Incomplete use of rhetoric or evidence to support the position of a societal issue.	Able to use rhetoric or evidence to support the position of a societal issue.	Able to critique rhetoric or evidence from both sides of a societal issue and make a conclusion.