2018 – 19 Departmental Assessment Plan

Department/Program/Unit: Natural & Computer Sciences   **Date: 9/05/18**
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Departmental/Program/Unit Student Outcome: *What student outcome from the departmental matrix will be assessed? (It is suggested that you cut and paste directly from the matrix. Outcomes should represent the absolute priorities for learning- students must be able to do [this] when they finish our program).* **State as follows: Students should be able to [action verb] [something]**.   Students will be able to make appropriate inferences and interpretations from scientific data.
Background: *What factors caused you to choose this particular assessment outcome? If you chose this outcome because of a perceived problem, please explain.*   Every scientific discipline has standard techniques they use to analyze not only results, but the accuracy, precision, and robustness of the results. These are often statistical techniques, algorithmic analyses, modeling, or other similar techniques. While these are important scientific skills, they are often "glossed over" in class and lab in an effort to simply achieve a result. So we want to assess whether students learn these techniques and can apply them, or if we have to emphasize them more.
Question: *What specific question(s) are you attempting to answer through assessing this student outcome? (What are you trying to find out? There may be more than one question, but no more than three.)*   "Are students able to use appropriate methods to verify the accuracy and robustness of their results?"

Methodology:
     1. *OBJECT* - What data (i.e. artifact, exam score, detailed description of assignment) will be collected?* Lab reports from Phys 382, Lab reports from Chem 325, Lab reports from Bio 317, and algorithm assignment from CS 344
         a. *How does this data address the assessment question?* Each of these objects include the numerical results of a result, which need to be analyzed to determine the significance, accuracy, precision, or robustness of the result. (That is, there will need to be statistical or algorithmic tests applied in order to determine if the result is sound, or the result of random chance, or suffering from some sort of error in some way.)
             i. *Include/attach a description/example of assessment tool to be used*.
     2. *How will data be collected?* Lab reports and assignments will be collected as a part of the normal classroom process, scanned without identifying details, and distributed to departmental faculty.

Analysis of Artifacts: *PERFORMANCE CRITERIA* **-** Discuss:*
  1) *How the artifacts will be analyzed (attach rubrics/scoring tools if used):* Artifacts will be assessed using a Likert scale attached, which scores the students' ability to apply the appropriate methods, and also to correctly describe the results of the analysis.
  2) *How you will know if it is good (i.e. score required by % of students):* We will use the attached rubric to assess collected artifacts with the goal that 80% of students score 3 or better. More importantly, (since ironically the small numbers of samples involved ensure that any result will not be statistically significant) we will use the artifacts to assess whether courses and activities in the program adequately prepare students to use appropriate methods to verify the accuracy and robustness of their results.

Submitted by: Robert Hermann   **Date:**   **9/21/18 Assessment Committee Reviewed (Date):**   **10/2/18**
Department Chair notified of approval/or additional action needed: **10/11/18**