**#2. Executive Summary: Undergraduate Program Assessment: Student Outcomes**

To be completed by Departments and submitted by the Department Chair to the Assessment Blackboard Site.

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| **Department:** **Natural Sciences Date: 28 June 2016** |
| **Members involved with analysis of artifacts:** **Dr. John Jurchen, Dr. Kristy Jurchen, Dr. Rob Hermann, Dr. Brent Royuk, Dr. Kyle Johnson, Dr. Connie Callahan, Dr. Tim Huntington, and Jen Fruend** |
| **See #1 Undergraduate Program Assessment Plan: Student Outcomes for:** *a) Student Outcome; b) Background; c) Question(s); d) Methodology*  |
| **Analysis of artifacts:** *1).* ***PERFORMANCE CRITERIA****\* - How was data analyzed? (attach rubrics/scoring tools if used).* A representative sample (six to ten in most cases) of lab reports or papers from upper-level science lab courses in which students were expected to make appropriate conclusions from their experiements was collected. Conclusions were read and scored collectively by the department using a Likert scale from 1-5 (5 being best), where scores of three or above (moderately, well, or exceptionally well done) were judged to have succeeded to have made the appropriate conclusion. The courses supplying rubrics were: Fall 2015: Bio 208, Chem 231, Phys 382; Spring 2016: Chem 331, Phys 399.  |
| **Summary of RESULTS\*:** *1). Restate the assessment question(s) (from the Assessment plan):* Are students in science labs where data is collected making appropriate conclusions about what was examined in their experiments or are they just repeating their results?*2). Summarize the assessment results. A narrative summary is required. Charts, tables or graphs are encouraged but optional.* Overall, with a total of 32 artifacts assessed, we found that 84.5% of them achieved a 3 or better; that is, they made at least moderately appropriate conclusions rather than just repeating their results.

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|  | Evaluation of Conclusions |
|  | 1 | 2 | 3 | 4 | 5 |
|  | Not done | Minimally done | Moderately done | Well done | Exceptionally well done |
| N | 1 | 4 | 9 | 4 | 14 |
| % | 3 | 12.5 | 28 | 12.5 | 44 |
| % | 15.5 | 84.5 |

*3).* ***INTERPRETATION****\* - Discuss how the results answer the assessment question(s).*We found that generally students were able to make appropriate conclusions from their data. There was a concern originally that students merely parroted their results in the conclusion of the lab report, rather than using higher-level thinking to analyze what the results mean. Over the years that the department has assessed this question we have found improvement in the results, suggesting that we are doing a better job of helping students to understand that this final step is an important part of doing science, and students are learning to do it.*4). Observations made that were not directly related to the question(s).* (*i.e. interrater reliability of the scoring tool was low*) We still have an issue that different instructors and different courses expect different things from their conclusions, making the evaluation difficult. |
| **Sharing of Results:** *When were results shared? Date:* 28 June 2016*How were the results shared? (i.e. met as a department)* We met as a department to evaluate, score, analyze, and discuss the assessment.*Who were results shared with? (List names):* **Dr. John Jurchen, Dr. Kristy Jurchen, Dr. Rob Hermann, Dr. Brent Royuk, Dr. Kyle Johnson, Dr. Connie Callahan, Dr. Tim Huntington, and Jen Fruend** |
| **Discussion of Results –Summarize your conclusions including:** 1. **ACTION\*-** *How will what the department learned from the assessment impact the teaching process/course/program etc. in your department starting the next academic year?*

 We have found that we are able to improve students’ performance in a critical area of writing conclusions. We will continue to emphasize this both in the classes we assessed and in other classes. *2.* **IMPACT\*-** *What is the anticipated impact of the* **ACTION\*** *on student achievement of the learning outcome in the next academic year?*  Our hope is that students will continue to be able to make appropriate conclusions from their results in the lab.*3.* **BUDGET IMPLICATIONS** – *Indicate budget requirements necessary for the successful implementation of the* **ACTION\*** (i.e. an additional staff person, new equipment, additional sections of a course). None |
| ***If action is taken – it is recommended that the same learning outcome and assessment plan be used for a second assessment cycle.*** |
| ***What assessment questions related to the learning outcome would the program like to investigate in the future?*** Having achieved fairly good results from this question, we plan to move to a different question next year: Are students able to correctly use statistics to make appropriate inferences from data? |
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| **Submitted by:** Rob Hermann **Reviewed by the Assessment Committee (date): 6/29/16** |
| **Department Chair notified/additional action needed: 6/29/16** **BUDGET IMPLICATIONS – Assessment Committee Chair notified appropriate Dean: na** **Approved & Posted to Assessment site: 6/29/16** |
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| **Natural Sciences Department Program Assessment Rubric** |
| **Learning Goal Assessed:** Analysis: to recognize, understand, critically evaluate, and synthesize the components of a topic using logic and the scientific method |
| **Student Outcome Assessed:** Students should be able to make appropriate inferences and interpretations from scientific data |
| **Semester:** |  |
| **Course:** |  |
| **Artifact Assessed:** |  |
| **Rubric** | Quality of student outcomes (made appropriate inferences and interpretations) will be assessed in artifacts using the Likert scale below |
| 1- not done at all; 2 - minimally done 3; - moderately done; 4 - well done; 5 - exceptionally well done |
| **Artifacts** | **1** | **2** | **3** | **4** | **5** | **Comments** |
| **1** |  |  |  |  |  |  |
| **2** |  |  |  |  |  |  |
| **3** |  |  |  |  |  |  |
| **4** |  |  |  |  |  |  |
| **5** |  |  |  |  |  |  |
| **6** |  |  |  |  |  |  |
| **7** |  |  |  |  |  |  |
| **8** |  |  |  |  |  |  |
| **9** |  |  |  |  |  |  |
| **10** |  |  |  |  |  |  |
| **Summary** |  |  |  |  |  |  |
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| **Conclusions:** |  |