STUDENT LEARNING ASSESSMENT REPORT

PROGRAM: Biology and Physical Sciences
SUBMITTED BY: Amanda Wright
DATE: September 30, 2020

Executive Summary: Description of Assessment Process

List *all* of the program's learning outcomes, as of the assessment year's catalog: *(regardless of whether or not they are being assessed this year)*

Goals	Learning Outcomes	Year of Last Assessment	Assessed This Year	Year of Next Planned Assessment
1. Students will be able to independently conduct and evaluate scientific research.	1. Students can formulate scientifically sound hypotheses	2017-2018	yes	2021-2022
	2. Students can design ~~and implement~~ a research project	2017-2018	yes	2021-2022
	3. Students can analyze data ~~and draw conclusions~~	2017-2018	yes	2021-2022
	4. Students can critically evaluate scientific literature	2017-2018	yes	2020-2021*
2. Students will be able to demonstrate effective oral and written scientific communication skills.	1. Students can develop coherent written arguments.	2017-2018	yes	2021-2022
	2. Students can write using current scientific styles.	2017-2018	yes	2021-2022
3. Students will understand the moral and ethical impact of sciences on their communities, both local and global.	1. Students will identify ethical dilemmas associated with current scientific innovations	2018-2019	no	2020-2021
	2. Students will reflect upon ethical dilemmas from a scientific perspective (new language) *2. Students will follow ethical norms of scientific communication (old language)*	2018-2019	no	2020-2021
4. Students will be able to integrate a range of scientific concepts and ideas.	1. Students can make connections between similar content ideas from different courses	2018-2019	no	2020-2021

Provide a <u>brief</u> description of the assessment process used including how results are shared and discussed and strengths, challenges, and planned improvements to the <u>process</u>, providing evidence of a culture of continuous improvement based on assessment. If there is something that is impeding your ability to implement improvements, please comment on those issues *(generally not more than two paragraphs, may use bullet points)***:**

We have implemented some significant changes in our assessment procedure during the previous academic year. For many years, we have discussed the challenges of the DAT and consistency of assessment among our adjunct faculty in Bio 151, specifically. This year, we decided to eliminate use of the DAT in place of simpler, better aligned rubrics and we placed the responsibility of

assessment on full time faculty only. In addition, we tweaked our outcome language to eliminate "and" statements, making assessment more reliable. Changes in the outcome language are indicated above by strikethrough text.
In previous years, we have utilized the DAT as means of assessing our first year (Bio 151) students, junior level (Bio 300/368) students, and senior students (Bio 410). This year; however, we focused our assessment on junior and senior level students. We intend to develop an entrance exam (reflective of our exit exam) but we do not yet have that assessment tool in place.

Our assessment results are shared and discussed in our first department meeting in September. Each faculty member is sent a copy of the report and the assessment coordinator shares a short presentation with the faculty during this meeting. Ideas for changes or improvements are discussed and assigned. All rubrics, exam results, and assessed materials are stored on a shared Canvas site (if soft copies) or in locked cabinets in individual faculty offices (if hard copies).

Strength: We feel that our learning goals and outcomes are aligned nicely and the adjustments to our outcomes make them stronger in terms of reliable assessment. The new rubrics we have implemented directly measure student's abilities on each outcome and we feel we have improved consistency across all assessment measures. The changes we have implemented this year speak directly to some of the challenges noted last year. See italics below:
Quoted from 2018-2019 assessment report: "Challenges: Our major challenges remain to be sifting through a tremendous amount of data in an efficient, organized way. Specifically, we currently use the DAT rubric to assess many of our outcomes. We acknowledge some problems with consistency with this tool that we would like to address. In addition, the data collection and analysis from this tool is cumbersome and time-consuming."

Current Challenges: Currently, we are working to develop a replacement measure for our first year (Bio 151 students), likely in the form of an entrance exam that mirrors our exit exam. We had intended to administer this during the 2019-2020 academic year but we were not successful at implementing this measure. Thus, introductory students were not assessed this year. We will not be able to speak to growth in each outcome across the four years in this report. We do plan to implement such a measure in this academic year or certainly in coming years.

Closing the Loop: Progress on Planned Improvements from Prior Year

Describe how the program implemented its planned improvements from last year:

Outcome	Planned Improvement	Update
All outcomes	Replace DAT as an assessment measure	We have developed and implemented rubrics (see Appendices B-D) that are utilized in Bio 360, Bio 368, and Bio 410 that more closely aligned with outcomes. These rubrics are completed by full-time faculty and every student is assessed by the same faculty member, thus improving consistency.
Goal 1: Students will be able to independently conduct and evaluate scientific research	Device assessment tools for our undergraduate research experience	We have not yet been able to complete development or implementation of the research experience tool. This is still something we would like to do but we have concluded that we need help in developing a strong, valid tool. We have; however, developed a strategy for assessing evaluation of scientific research more effectively. Unfortunately, due to COVID, we were unable to implement this strategy in the Spring semester.

Provide a response to last year's University Assessment Committee review of the program's learning assessment report:
Comment: Outcome 1: (Ethical Dilemmas) Your outcomes are well worded and acceptable. However, we suggest that you consider adding additional text or another outcome to address a gap we see between the learning outcomes and Goal 3. For Goal 3, the two Learning Outcomes do not adequately capture the scope of the Goal. The goal states that students will understand the moral and ethical impact of science on the community. But Learning Outcome 1 focuses on identifying an ethical dilemma. While important, simply identifying the dilemma is not sufficient to claim that students understand the impact of science on the community; do

students also need to demonstrate an ability to analyze or reflect on the dilemma? Learning Outcome 2 focuses on ethical communication of science. While important, that does not really match the overall goal. The other goals and outcomes are clear and reflect an appropriate level of learning.

Response: We have edited outcome 2 of goal 3 to better align with our intentions of this objective. Instead of focusing on communication norms, we have shifted the focus of this outcome to be upon scientific reflection of ethical dilemmas. The new language for outcome 2 of goal 3 states "students will reflect upon ethical dilemmas from a scientific perspective."

Comment: For Goal 3, the report could explain in more detail how the assessment measures based on the exit exam relate to the Goal and Learning Outcomes. There is some explanation in the analysis, but it needs to be clear when the measure is described. The questions also seem fairly thin considering the scope of the Goal and Outcome, which concern the ethical implications of science for the community. For example, a question could ask students to analyze or evaluate an ethical dilemma. Also, the targets for these measures are based on students' grade on a particular portion of the overall grade, but does that grade only measure what is being assessed, or does it include other things as well? The measures and targets for the other goals were much clearer and focused.

Response: The department will be working during the current academic year to develop appropriate rubrics to address the changes described above to the outcomes of goal 3. This goal will be assessed during the 2020-2021 academic year so we will have something in place by the end of the Fall semester.

Goal 1: Students will be able to independently conduct and evaluate scientific research.

Learning Outcome 1: Students can formulate scientifically sound hypotheses

Outcome Measures *Explain how student learning will be measured and indicate whether it is direct or indirect.*	**Performance Standard** *Define the acceptable level of student performance.*	**Data Collection** *Discuss the process for collecting this data: who conducted the assessment, when, and how?*	**Result** *Did you meet your target? What was the result?*
Direct: Exit exam questions 1-3, 13, 21 (Appendix A)	70% of students will achieve a score of 60% or more on the pertinent questions	The exit exam was given to 7 BA biology students, 35 BS biology students, and 11 biochem students over the past 2 years.	**BA BIO:** 71% (5/7) scored at least 60% on this section. *The performance standard was met.* **BS BIO:** 63% (22/35) scored at least 60% on this section. *The performance standard was not met.* **BIOCHEM:** 73% (8/11) scored at least 60% on this section. *The performance standard was met.*
Direct: Bio 368 Lab report rubric, "Students can formulate scientifically sound hypotheses"	70% of students will achieve a score of at least (0.8 out of 1) 80% in the category, indicating a range of good, very good, or excellent according the rubric in Appendix B.	In Fall 2019 or Spring 2020 6 BA, 21 BS, and 6 Biochem students completed a small independent research project in Bio 368 (Advanced Lab Research Methods). Students wrote a lab report based on the project, which was assessed by the course instructor.	**BA BIO:** 100% (avg .917) scored at least 80% on this section. *The performance standard was met.* **BS BIO:** 90% (avg 0.9) scored at least 80% on this section. *The performance standard was met.* **BIOCHEM:** 100% (avg 0.967) scored at least 80% on this section. *The performance standard was met.*

Interpretation of Results

Analysis and Implications: In general, our students performed well on this outcome. BS Bio students did not meet the performance standard on the exit exam but they did quite well on the writing rubric. We recognize that it may be harder for students to develop a hypothesis from research with which they may not be as familiar (which is the case on the exit exam). This is particularly the case with question #21 on the exit exam. Only 4 of all the students tested answered this question correctly. We have revised the question previously but plan to do so again. In the Bio 368 class, students are familiar with the topics they are researching and thus, likely have a better grasp on developing the hypothesis.

Discuss planned curricular or program improvements for this year based on assessment of outcome: We will continue to emphasize the ability to formulate hypotheses in our core curriculum. We will continue to implement and introduce new inquiry learning projects that require students to develop and test scientifically sound hypotheses at all levels of our curriculum. We will also work more intentionally with students to develop hypotheses from information with which they are not as familiar.

Learning Outcome 2. Students can design a research project.

Outcome Measures	Performance Standard	Data Collection	Result
Direct: Exit exam questions 4-7, 9, and 14-17.	70% of students will achieve a score of 60% or more on the pertinent questions corresponding to each learning outcome of the exit exam.	The exit exam was given to 7 BA biology students, 35 BS biology students, and 11 biochem students over the past 2 years.	**BA BIO:** 71% (5/7) scored at least 60% on this section. *The performance standard was met.* **BS BIO:** 89% (31/35) scored at least 60% on this section. *The performance standard was met.* **BIOCHEM:** 100% (11/11) scored at least 60% on this section. *The performance standard was met*
Direct: Bio 368 Lab report rubric, "Students can design a research project: Give enough details to allow for replication of procedure"	70% of students will achieve a score of at least (0.8 out of 1) 80% in the category, indicating a range of good, very good, or excellent according the rubric in Appendix B.	In Fall 2019 or Spring 2020 6 BA, 21 BS, and 6 Biochem students completed a small independent research project in Bio 368 (Advanced Lab Research Methods). Students wrote a lab report based on the project, which was assessed by the course instructor.	**BA BIO:** 100% (avg .917) scored at least 80% on this section. *The performance standard was met.* **BS BIO:** 81% (avg 0.867) scored at least 80% on this section. *The performance standard was met.* **BIOCHEM:** 100% (avg 0.967) scored at least 80% on this section. *The performance standard was met.*
Indirect: Alumni Survey, "Conduct research to support a position" and "Solve problems in your field using your knowledge and skills."	85% of respondents perceive their preparation as good or excellent.	The survey was sent to alumni from the biology programs and data was collected by the Office of Institutional Effectiveness.	Of the 11 respondents from 2019, 54.5% perceived their preparation as good or excellent in the area of solving problems in their field. We have no way to know if these alumni were BA, BS, or BIOCHEM students. *The performance standard was not met.*

Interpretation of Results

Analysis and Implications: In general, our students were successful in achieving this outcome. Performance on the exit exam and the lab report rubric was quite high and much improved to our assessment of this outcome two years ago. Our alum reported that they did not feel prepared in this area on this survey. This was somewhat surprising as we have not seen that result in previous alumni surveys. We have, in recent years, increased our focus on students conducting independent research and we believe this is evident in how our current students performed on this outcome. We anticipate that as more students graduate with this type of preparation, we will see alumni numbers improve.

Discuss planned curricular or program improvements for this year based on assessment of outcome: We will continue to emphasize the ability to design effective research projects in our curriculum. We have implemented several small independent research projects within courses and we continue to offer research experiences with faculty. This year our faculty will be working to develop a master's program that would provide additional research opportunities for students (and alums!).

Learning Outcome 3. Students can analyze data.

Assessment Activity

Outcome Measures	Performance Standard	Data Collection	Analysis
Direct: Exit exam questions 8, 10, 12, 18-20	70% of students will achieve a score of 60% or more on the pertinent questions	The exit exam was given to 7 BA biology students, 35 BS biology students, and 11 biochem students over the past 2 years.	**BA BIO:** 14% (1/7) scored at least 60% on this section. *The performance standard was not met.* **BS BIO:** 34% (12/35) scored at least 60% on this section. *The performance standard was not met.* **BIOCHEM:** 82% (9/11) scored at least 60% on this section. *The performance standard was met*
Direct: Bio 368 Lab report rubric, "Students can analyze data: Present findings clearly and with sufficient support"	70% of students will achieve a score of at least (0.8 out of 1) 80% in the category, indicating a range of good, very good, or excellent according the rubric in Appendix B.	In Fall 2019 or Spring 2020 6 BA, 21 BS, and 6 Biochem students completed a small independent research project in Bio 368 (Advanced Lab Research Methods). Students wrote a lab report based on the project, which was assessed by the course instructor.	**BA BIO:** 83% (avg .883) scored at least 80% on this section. *The performance standard was met.* **BS BIO:** 86% (avg 0.88) scored at least 80% on this section. *The performance standard was met.* **BIOCHEM:** 100% (avg 0.98) scored at least 80% on this section. *The performance standard was met.*

Interpretation of Results

Analysis and Implications: Interestingly, this performance standard was met using the lab report rubric but was largely unmet when measured with the exit exam. Using the lab report rubric students are asked to analyze their own data, with which they would be intimately familiar. On the exit exam, students are asked to analyze another scientist's data, which would be more unfamiliar to them. It is encouraging that students were able to analyze data with which they were familiar and had worked with extensively. It is actually not all together surprising that students struggled with this on the exit exam. The skill of analyzing another scientist's data is rather advanced but is certainly an opportunity for growth. Faculty in the department will be discussing this issue in the coming year.

Discuss planned curricular or program improvements for this year based on assessment of outcome: We are encouraged by the data from the lab report rubric and will continue to ask students to analyze their own data in a clear and supported way through other projects and class assignments. Students seem to struggle when asked to analyze other scientist's data. This is something we will be addressing through a newly established journal club where we will read scientific articles and invite authors of those articles to campus for seminars. Students will have the opportunity to analyze data from those papers and then ask questions.

Learning Outcome 4. Students can critically evaluate scientific literature

Assessment Activity

Outcome Measures	Performance Standard	Data Collection	Analysis
Direct: Exit exam questions 11,27-30	70% of students will achieve a score of 60% or more on the pertinent questions	The exit exam was given to 7 BA biology students, 35 BS biology students, and 11 biochem students over the past 2 years.	**BA BIO:** 43% (3/7) scored at least 60% on this section. *The performance standard was not met.* **BS BIO:** 23% (8/35) scored at least 60% on this section. *The performance standard was not met.* **BIOCHEM:** 27% (3/11) scored at least 60% on this section. *The performance standard was not met*

Interpretation of Results

Analysis and Implications: Out students are clearly still struggling to meet this outcome and our performance standard. Unfortunately, we were not able to fully assess this outcome during this academic year. We made some changes over the previous two years as to how we assess this outcome and thus, we are no longer using the GSS or alumni surveys. Those surveys ask participants to evaluate the quality or reliability of the source. Our intention with this outcome is to assess student's ability to evaluate or analyze the content of the source. Thus, we felt that the GSS and alumni surveys were not applicable to this outcome. We have plans to implement a rigorous assessment protocol that will be performed both at the mid-level (200/300 classes) and at the senior level (Bio 410). However, we were unable to perform that assessment this year. Due to this, we plan to assess this specific outcome next year (even though it would be "out of rotation").

Discuss planned curricular or program improvements for this year based on assessment of outcome: This outcome will also be addressed by the newly formed journal club, where students will read papers and then meet with authors of the papers they read to discuss scientific concepts and ask questions. In addition, based on the newly developed assessment plan, students will be asked to critically evaluate science articles earlier in their academic careers.

Goal 2: Students will be able to demonstrate effective oral and written scientific communication.

Learning Outcome 1: Students can develop coherent written arguments.

Assessment Activity

Outcome Measures	Performance Standard	Data Collection	Analysis
Direct: Bio 300 Writing rubric, "Purpose, Evidence, Analysis" Student creatively communicate an understanding of the assignment through awareness of audience, tone, and structure. Provides relevant information/data, including clear, accurate analysis of the evidence, and/or summaries of the most important ideas through a unique and innovative perspective.	70% of students will achieve a score of at least (0.8 out of 1) 80% in the category, indicating a range of good, very good, or excellent according the rubric in Appendix C.	In Fall 2019 or Spring 2020 6 BA, 24 BS, and 9 Biochem students completed an independent writing project in Bio 300 (Writing for Science). Students wrote science research paper, which was assessed by the course instructor.	**BA BIO:** 67% (4 of 6 students) scored at least 80% on this section (avg 0.77). *The performance standard was not met.* **BS BIO:** 71% (avg 0.788) scored at least 80% on this section. *The performance standard was met.* **BIOCHEM:** 78% (avg 0.823) scored at least 80% on this section. *The performance standard was met.*
Direct: Bio 300 Writing rubric, "Topic Sentence, Body Paragraph, & Conclusion" Contains appropriate sections including an introduction. Conclusions are generally logical and based on information. Structure follows a logical progression.	70% of students will achieve a score of at least (0.8 out of 1) 80% in the category, indicating a range of good, very good, or excellent according the rubric in Appendix C.	In Fall 2019 or Spring 2020 6 BA, 24 BS, and 9 Biochem students completed an independent writing project in Bio 300 (Writing for Science). Students wrote science research paper, which was assessed by the course instructor.	**BA BIO:** 67% (4 of 6 students) scored at least 80% on this section (avg .78). *The performance standard was not met.* **BS BIO:** 75% (avg 0.783) scored at least 80% on this section. *The performance standard was met.* **BIOCHEM:** 78% (avg 0.8) scored at least 80% on this section. *The performance standard was met.*
Indirect: Alumni Survey, " "Develop a coherent written argument"	85% of respondents perceive their preparation as good or excellent.	The survey was sent to alumni from the biology programs and data was collected by the Office of Institutional Effectiveness.	Of the 11 respondents from 2019, 54.5% perceived their preparation as good or excellent in the area of developing a coherent written argument. We have no way to know if these alumni were BA, BS, or BIOCHEM students. *The performance standard was not met.*

Interpretation of Results

Analysis and Implications: This performance standard was partially met. Using our direct measure of the newly adopted rubric in Bio 300, only the BA students did not meet expectations, although it was a small number of students and 4 of the 6 did achieve the

standard. We feel that this rubric is an appropriate tool to assess this outcome and is an improvement over the DAT we have used for many years. The assignment that was used for assessment this year was a mid-semester research paper. In the future, we may switch to assessing a paper that students write toward the end of the semester, when they have had a chance to better hone their skills in this particular area. Surprisingly, our alumni also reported not feeling prepared in this area.

Discuss planned curricular or program improvements <u>for this year based on assessment of outcome:</u> Writing will continue to be an integral part of our curriculum and we will continue to emphasis scientific writing in all of our courses, not just our WI courses. We will be working to "standardize" our writing expectations throughout our curriculum so students get introduced to these norms early and have opportunities to practice and perfect their writing over their four years. We feel that maintaining common expectations in all classes will give students a clearer understanding of effective writing.

Learning Outcome 2: Students can write using current scientific styles.

<u>Assessment Activity</u>

Outcome Measures	Performance Standard	Data Collection	Analysis
Direct: Exit exam questions 36-40	70% of students will achieve a score of 60% or more on the pertinent questions	The exit exam was given to 7 BA biology students, 35 BS biology students, and 11 biochem students over the past 2 years.	**BA BIO:** 57% (4/7) scored at least 60% on this section. *The performance standard was not met.* **BS BIO:** 60% (21/35) scored at least 60% on this section. *The performance standard was not met.* **BIOCHEM:** 91% (10/11) scored at least 60% on this section. *The performance standard was met*
Direct: Bio 300 Writing rubric, "Word Choice & Vocabulary": Student consistently uses science terms/units that are appropriate and specific to the subject area/content being analyzed in a complete and thorough manner.	70% of students will achieve a score of at least (0.8 out of 1) 80% in the category, indicating a range of good, very good, or excellent according the rubric in Appendix C.	In Fall 2019 or Spring 2020 6 BA, 24 BS, and 9 Biochem students completed an independent writing project in Bio 300 (Writing for Science). Students wrote science research paper, which was assessed by the course instructor.	**BA BIO:** 67% (4 of 6 students) scored at least 80% on this section (avg .78). *The performance standard was not met.* **BS BIO:** 71% (avg 0.783) scored at least 80% on this section. *The performance standard was met.* **BIOCHEM:** 67% (6 of 9 students) (avg 0.789) scored at least 80% on this section. *The performance standard was not met.*
Direct: Bio 300 Writing rubric, "Grammar & Conventions" Meets all the requirements of scientific writing with respect to sentence structure, grammar, mechanics, and usage.	70% of students will achieve a score of at least (0.8 out of 1) 80% in the category, indicating a range of good, very good, or excellent according the rubric in Appendix C.	In Fall 2019 or Spring 2020 6 BA, 24 BS, and 9 Biochem students completed an independent writing project in Bio 300 (Writing for Science). Students wrote science research paper, which was assessed by the course instructor.	**BA BIO:** 50% (3 of 6 students) scored at least 80% on this section (avg .767). *The performance standard was not met.* **BS BIO:** 71% (avg 0.775) scored at least 80% on this section. *The performance standard was met.* **BIOCHEM:** 55% (5 of 9 students) (avg 0.778) scored at least 80% on this section. *The performance standard was not met.*

Interpretation of Results

Analysis and Implications: Our students struggled to meet this performance standard in almost each area assessed. We have revised the problematic questions on the exit exam from two years ago and feel that no particular question was problematic during this assessment. We think the newly implement rubric is a good measure of our student's ability on this outcome. There have been recent changes to widely accepted writing styles in science that, as a department, we are adjusting to. For example, for many years science articles have been written in 3rd person, passive voice. There is now a tendency to move away from this style and we are trying to shift our student's understanding of that as well. Perhaps this shift explains why our students struggled with this outcome in this assessment cycle.

Discuss planned curricular or program improvements for this year based on assessment of outcome: We are currently working to standardize the style of science writing that is taught in our department, following trends and shifts in science writing globally. We will be working to implement these styles across all class in the coming year to help eliminate confusion with these changes.

Learning Outcome 3: Students can deliver oral scientific presentations

Assessment Activity

Outcome Measures	Performance Standard	Data Collection	Analysis
Direct: Exit exam questions 31-35	70% of students will achieve a score of 60% or more on the pertinent questions	The exit exam was given to 7 BA biology students, 35 BS biology students, and 11 biochem students over the past 2 years.Fall 2019 or Spring 2020.	**BA BIO:** 57% (4/7) scored at least 60% on this section. *The performance standard was not met.* **BS BIO:** 51% (18/35) scored at least 60% on this section. *The performance standard was not met.* **BIOCHEM:** 82% (9/11) scored at least 60% on this section. *The performance standard was met*
Direct: Bio 410 Presentation rubric	70% of students will score at least 40 out of 50 points (80%) on the presentation rubric according the rubric in Appendix D.	In Spring 2020, 4 BA, 15 BS, and 1 Biochem student(s) completed an oral presentation in Senior Seminar (Bio 410). This presentation was assessed by the course instructor.	**BA BIO:** 100% (4/4) scored at least 80% on this section. *The performance standard was not met.* **BS BIO:** 100% (15/15) scored at least 80% on this section. *The performance standard was met.* **BIOCHEM:** 100% (1/1) scored at least 80% on this section. *The performance standard was met.*
Indirect: Alumni Survey, "Deliver a coherent oral presentation."	85% of respondents perceive their preparation as good or excellent.	The survey was sent to alumni from the biology programs and data was collected by the Office of Institutional Effectiveness.	Of the 11 respondents from 2019, 54.5% perceived their preparation as good or excellent in the area of oral presentations. We have no way to know if these alumni were BA, BS, or BIOCHEM students. *The performance standard was not met.*

Interpretation of Results

Analysis and Implications: While some student groups struggled with this outcome on the exit exam, all groups met expectations when assessed using the rubric (although in somewhat smaller numbers). This is not surprising as we feel that it is more

representative to assess our student's ability to deliver an oral presentation when they are actually doing it versus testing them on standard procedures using the exit exam. Unfortunately, our alum did not feel well prepared in this area so we still have some work to do to ensure our students are given multiple opportunities to deliver and constructive feedback on all oral presentations.

Discuss planned curricular or program improvements for this year based on assessment of outcome: All students give oral presentation in senior seminar (Bio 410) in their senior year. We are going to work to implement more opportunities for oral assignments in other classes, which can be assessed using the same rubric.

Appendices

Appendix A: **Biology Exit Exam**
The complete exit exam can be found by clicking the link above. If the committee prefers that we copy/paste the document here, we are happy to do so.

Appendix B: **Bio 368 Rubric**
The complete Bio 368 rubric for the independent research assignment can be found at the link above. If the committee prefers that we copy/paste the document here, we are happy to do so.

Appendix C: **Bio 300 Rubric**
The complete Bio 300 rubric for the science writing assignment can be found at the link above. If the committee prefers that we copy/paste the document here, we are happy to do so.

Appendix D: **Bio 410 Rubric**
The complete Bio 410 rubric for the oral presentation assignment can be found at the link above. If the committee prefers that we copy/paste the document here, we are happy to do so.