Program Name: Biology Clinical Laboratory Science

Assessed by: Jeff Goff, Dept. of Natural Sciences

Date/Cycle of Assessment: Submitted on 10/31/2016;
Reporting cycle of January 2015 – December 2015

Mission Statement:

The Malone University Department of Natural Sciences exists to engage students in the study of God's majesty and character by exploring His handiwork as it is revealed in Nature, both animate and inanimate; to promote the wise and thoughtful stewardship of the natural resources He has entrusted to us; and to encourage students to demonstrate God's love in their respective communities by using the knowledge and skills they acquire here.

Program Goals:

- Students should comprehend the central concepts of biology and chemistry, the underlying assumptions of biological knowledge and chemical knowledge, and be able to employ the methods of inquiry commonly utilized by practicing biologists and chemists at a level sufficient for entrance into graduate school, professional schools, and other biological vocations (Stems from Malone Educ. Goals A4, D1, and D3).
- Students should become proficient in solving biological and chemical problems using both quantitative and qualitative approaches and in analyzing / interpreting data generated by experimental protocols commonly employed by practicing biologists/chemists (Stems from Malone Educ. Goals C3, D4, and D5).
- Students should be able to apply the principles of Christian Stewardship to biological practice and interpret biological and chemical phenomena within a Christian worldview (Stems from Malone Educ. Goals D2, E1, and E5).

- Students should develop an enriched understanding of the nature of human identity, development, and behavior through a study of human anatomy and physiology. (Stems from Malone Educ. Goal A3)

MALONE UNIVERSITY ANNUAL ASSESSMENT REPORT (See Appendix for Raw Data and Detailed Analysis)

Department: *Natural Sciences*
Program: *Biology Clinical Laboratory Science*
Assessed by: *Jeffrey M. Goff - Dept. of Natural Sciences*
Time Period Covered: *January 2015-December 2015*
Submission Date: *10/31/2016*

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
Demonstrate the capability of integrating data and assessing phenomena within a Christian paradigm (Departmental Outcome A).	1) Average cumulative score ≥ 12; minimum cumulative score of 8; no individual component score of 1 on the Faith and Learning Assessment Instrument as scored by the associated rubric.	Average composite score = 14.41; minimum composite score = 8; # of individual component scores of 1 was 3.	Data here represent the sixth data set ever collected with this instrument. Average composite score and individual composite scores all met the departmental criteria for success. However, 3 individual component scores were not acceptable. Two of the low individual component scores were from a single individual's essays who, we believe, avoided the question due to the sensitivity of the material. As a result, the department reworded the instrument to be less offensive to students whose worldviews differ significantly from Malone's in order to elicit more on-task participation.
Demonstrate a comprehension of the central concepts of chemistry including the major theories and laws which govern chemical phenomena (Departmental Outcome B).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Gen Chem II Exam. 2) ACS Gen Chem II Exam score used as a Pre-Test for obtaining baseline data only (not used to assess success, but merely preparation for freshman chemistry sequence).	1) Mean score on the ACS Gen Chem Exam is 29.14 (-0.80σ). Ten individuals failed to meet the -1.5σ criterion. 2) Class average on ACS Gen Chem pre-test is 18.81 giving strong evidence of student improvement, but the scores of the freshman cohort as it exits is well below the national average (24^{th} percentile)	The 10 low ACS Gen Chem Exam scores and the low average score for the cohort are in keeping with other recent cohorts and are disappointing to the department. The extremely low CCDT results for Fall 2008 - Fall 2010 are evidence that our students enter well below the national average, so cohorts exiting below the national average do not necessarily imply a poor program. The ACS Gen Chem II pre-test scores, when compared to the post-test scores, are extremely strong evidence that our students are improving as a result of our freshman chemistry sequence. The department has concluded that our students enter below the national average and then exit below the national average in spite of the significant improvement in content knowledge. The department responded by developing a new, alternative Gen Chem II course for Zoo and Wildlife Biology Majors. Course is scheduled to run for the first time in Spring 2017.

Demonstrate an understanding of the relationships between structure and behavior of the chemical elements in their various forms and combinations (Departmental Outcome C).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chem Exam. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam Organic sub-category.	1) Mean score on the ACS Organic Chem Exam was 36.45 (–0.23σ). No individuals failed to meet the -1.5σ criterion. 2) Average sub-score on the Organic section of the ETS chemistry exam was 61.0 (+0.89σ). No individuals failed to meet the –1.5σ criterion on the organic section.	1) This data set represents the fifth year in a row that ACS scores have met the departmental criteria for success. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. The introduction of a more rigorous prerequisite for Chem 132 (i.e., Chem 131 grade of C) is awaiting approval by the department pending the implementation of Chem 135 for Zoo & Wildlife Biology Majors in Spring 2017. 2) ETS scores were acceptable this year. The department has opted to not make any changes to the curriculum at this time.
Demonstrate safe laboratory practices and an environmental ethic as it pertains to chemical use and disposal (Departmental Outcome D).	Minimum scores of 20, 21, and 20 must be obtained respectively on 3 safety projects completed as a component of our Chem 201 course (Stewardship and Safety in Chemical Practice) and graded via associated rubrics. In addition to the composite scores criteria on all 3 projects, minimum individual element scores have also been set.	Of 9 students, only 1 student failed to reach the minimum score of 20 on Safety Project #1 (1 individual element score missed criterion). On Safety Project #2, all students met the minimum composite score criterion of 21 and all individual element scores were satisfactory as well. On Safety Project #3, all students met the minimum composite score criterion of 20, though 1 individual element score missed the minimum standard.	1) Although two individual element scores were low and 1 student failed to meet a minimum composite score, the instructor feels strongly that this was due to a lack of time. The extensive one-on-one time required of the professor/student precluded these individuals from repeating a few of the assessments. Rather than fail the students, the instructor opted to allow the few sub-par scores with the intention of scheduling additional sessions at the next offering to give each student enough opportunities to meet the minimum scores on each project. The same problem was noted in last year's report, so the good intentions of the instructor may not be sufficient to accomplish the desired change. To step the efforts up a notch, the instructor has also incorporated feedback from the class in a proposal to the department that would add an additional credit hour to the class to assure that the assessments have adequate time for completion.
Demonstrate an ability to analyze various kinds of experimental data used in the chemical disciplines including the output of various instrumental techniques (Departmental Outcome E).	1) Each student must obtain a minimum cumulative score of 15 on each of 5 instrumental assignments (i.e., IR/MS/NMR assignments) completed in Chem 322.	All students who passed the class met the minimum score of 15 on all 5 assignments.	Since 2012, a passing grade on each assignment has been officially required in order to pass the class. In Spring 2014, the instructor implemented a policy of assigning a grade of "Incomplete" until all students had met the minimum criteria. As a result, the number of deficient criteria has dropped dramatically. At the encouragement of the Chemistry Program's external reviewers, the departmental chemistry faculty have agreed to add an additional 4 instrumental assignments to the existing slate of 5. The chemistry faculty are hoping to implement these new assignments within the next one or two reporting cycles.

Demonstrate an understanding of the biological characteristics of each of the major kingdoms (Departmental Outcome F)	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Organismal Sub-score.	1) Average Organismal sub-score is 61.1 (+0.60σ). No individuals failed to meet the -1.5σ criterion.	In light of the successful scores of several recent cohorts on the organismal sub-section of the ETS, the department has opted to not make any programmatic changes at this time. Individuals missing the criterion of –1.5σ on other sub-sections or even as composite scores are a concern for us, but legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist. The department is more concerned when students who have acceptable GPAs routinely miss this threshold. This has occasionally happened, but not routinely. The department has slated this as an agenda item for a future departmental meeting.
Demonstrate an understanding of the fundamental concepts of molecular biology and genetics (Departmental Outcome G).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Molecular Biology and Genetics sub-scores.	1) Average Molecular Biology/Genetics sub-score is 58.8 (+0.45σ). Two individuals failed to meet the –1.50σ criterion.	The composite average score was well-above the national average this year. Although this is cause for celebration, individuals missing the criterion of –1.5σ are a concern for us. This has occasionally happened (two this year), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting.

Demonstrate an ability to properly relate biological structure and function (Departmental Outcome I).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Cell Biology sub-score.	1) Average Cell Biology sub-score is 53.9 (+0.07σ). A single individual failed to meet the –1.5σ criterion.	This sub-section of the ETS has historically been lowest. For this reason, a curricular change was proposed and passed by the full faculty that added one credit hour to the introductory Cell Biology course effective Fall 2012. It is still too early to tell if this curricular change will impact our scores on this section (i.e., Spring 2016 graduating class will be the first to take the ETS having benefited from this curricular change). Individuals missing the criterion of –1.5σ on other sub-sections or even as composite scores are a concern for us. This has occasionally happened (one this year on this sub-section), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Lastly, in last year's report, we indicated that we would like to add an additional instrument to assess this outcome -- a minimum score of 70% on the cell biology content of our in-house biology post-test. This has proved more difficult than at first anticipated and was not completed for this report. Since so many of our curricular/personnel changes should begin impacting the 2016 report data, we are holding off on the new assessment until then as well.
Demonstrate the capability of analyzing and reporting empirical data from the biological sciences (Departmental Outcome K).	Instrument has been dropped in favor of a newer one that has yet to be developed.	NO DATA	Previous reports have indicated that our department has been having a long and rather continuous conversation about the need to implement a research methods course. This course was finally developed and approved by the department and full faculty. It is scheduled to run in Fall 2016 for the first time. The exact nature of the assessment instrument is still in flux, but the department has completed the most difficult step in addressing this shortfall. It will be possible to build an appropriate assessment instrument into the course as it runs in Fall 2016.

Demonstrate a balanced concept of molecular, micro, and macro levels of biological phenomena in the context of human systems (Departmental Outcome L).	1) Mean score no lower than 8/12 on the A&P questions of the in-house biology post-test. No individual with a score lower than 5/12. (Note: New instrument – criteria are still being evaluated).	1) NO DATA for this reporting period.	Although Biol 132 exam scores were retained for several years with the goal of extracting the scores of our graduates from the overwhelming number of nursing students who took the course, the retirement of our A&P instructor has caused us to change course. The current in-house biology pre-test / post-test exam has been altered to accommodate roughly 12 questions covering human A&P content. The performance of our biology pre-professional students on these 12 questions will be used to show improvement in human A&P content knowledge. The first administration of this altered exam was tentatively scheduled for Spring 2015, but did not occur until Fall 2016. Preliminary data will be included in the 2016 assessment report. The current A&P instructor is also researching an additional assessment that might allow for true comparisons with national averages.
Demonstrate the ability to properly relate biological structure and function in the context of human systems (Departmental Outcome M).	1) Mean score no lower than 8/12 on the A&P questions of the in-house biology post-test. No individual with a score lower than 5/12. (Note: New instrument – criteria are still being evaluated).	1) NO DATA for this reporting period.	See comments in table cell for Departmental PILO 'L'.
Demonstrate the level of content mastery required for potential successful performance in graduate school biology programs or professional schools (Departmental Outcome N).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam composite score. 2) Mean score no lower than 31/50 and no individual score lower than 24/50 on the departmental biology Post-Test	1) Average ETS composite score is 160.1 (+0.53σ). Lowest individual score is 132 (-1.64σ). 2) Mean score on in-house Biology post-test is 34.07. One individual failed to meet the minimum score of 24 (lowest score was 17).	1) As has been the case for several years, the average ETS composite score has been meeting the departmental standard. Occasionally, an individual student fails to meet the minimum score – this happened again this year. The score of 132 in this year's data marks the second lowest ETS composite score ever obtained by a Malone student. Although legitimate reasons for individual students missing the cutoff do exist (e.g., illness, test anxiety), the department has an intuition that it can do more. 2) The score of 17 in this year's data was achieved by the same student that achieved the 132 on the ETS exam. This student obtained a score of 17 on the pre-test as well, and the lack of change, at face value, indicates that this student did not absorb any content knowledge whatsoever. Results of this nature are most unsettling. Several options to address the occasional outlier are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Until the impact of the extra credit hour in Biol 144 and the impact of biology faculty personnel changes are manifested, it seems premature to us to alter the curriculum.

Program Name: Biology (Pre-Medicine track)

Assessed by: Jeff Goff, Dept. of Natural Sciences

Date/Cycle of Assessment: Submitted on 10/31/2016;
Reporting cycle of January 2015 – December 2015

Mission Statement:

The Malone University Department of Natural Sciences exists to engage students in the study of God's majesty and character by exploring His handiwork as it is revealed in Nature, both animate and inanimate; to promote the wise and thoughtful stewardship of the natural resources He has entrusted to us; and to encourage students to demonstrate God's love in their respective communities by using the knowledge and skills they acquire here.

Program Goals:

- Students should comprehend the central concepts of biology and chemistry, the underlying assumptions of biological knowledge and chemical knowledge, and be able to employ the methods of inquiry commonly utilized by practicing biologists and chemists at a level sufficient for entrance into graduate school, professional schools, and other biological vocations (Stems from Malone Educ. Goals A4, D1, and D3).
- Students should become proficient in solving biological and chemical problems using both quantitative and qualitative approaches and in analyzing / interpreting data generated by experimental protocols commonly employed by practicing biologists/chemists (Stems from Malone Educ. Goals C3, D4, and D5).
- Students should be able to apply the principles of Christian Stewardship to biological practice and interpret biological and chemical phenomena within a Christian worldview (Stems from Malone Educ. Goals D2, E1, and E5).

MALONE UNIVERSITY ANNUAL ASSESSMENT REPORT (See Appendix for Raw Data and Detailed Analysis)

Department: *Natural Sciences*
Program: *Biology (Pre-Medicine Track)*
Assessed by: *Jeffrey M. Goff - Dept. of Natural Sciences*
Time Period Covered: *January 2015-December 2015*
Submission Date: *10/31/2016*

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
Demonstrate the capability of integrating data and assessing phenomena within a Christian paradigm (Departmental Outcome A).	1) Average cumulative score ≥ 12; minimum cumulative score of 8; no individual component score of 1 on the Faith and Learning Assessment Instrument as scored by the associated rubric.	Average composite score = 14.41; minimum composite score = 8; # of individual component scores of 1 was 3.	Data here represent the sixth data set ever collected with this instrument. Average composite score and individual composite scores all met the departmental criteria for success. However, 3 individual component scores were not acceptable. Two of the low individual component scores were from a single individual's essays who, we believe, avoided the question due to the sensitivity of the material. As a result, the department reworded the instrument to be less offensive to students whose worldviews differ significantly from Malone's in order to elicit more on-task participation.
Demonstrate a comprehension of the central concepts of chemistry including the major theories and laws which govern chemical phenomena (Departmental Outcome B).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Gen Chem II Exam. 2) ACS Gen Chem II Exam score used as a Pre-Test for obtaining baseline data only (not used to assess success, but merely preparation for freshman chemistry sequence).	1) Mean score on the ACS Gen Chem Exam is 29.14 (-0.80σ). Ten individuals failed to meet the -1.5σ criterion. 2) Class average on ACS Gen Chem pre-test is 18.81 giving strong evidence of student improvement, but the scores of the freshman cohort as it exits is well below the national average (24^{th} percentile)	The 10 low ACS Gen Chem Exam scores and the low average score for the cohort are in keeping with other recent cohorts and are disappointing to the department. The extremely low CCDT results for Fall 2008 - Fall 2010 are evidence that our students enter well below the national average, so cohorts exiting below the national average do not necessarily imply a poor program. The ACS Gen Chem II pre-test scores, when compared to the post-test scores, are extremely strong evidence that our students are improving as a result of our freshman chemistry sequence. The department has concluded that our students enter below the national average and then exit below the national average in spite of the significant improvement in content knowledge. The department responded by developing a new, alternative Gen Chem II course for Zoo and Wildlife Biology Majors. Course is scheduled to run for the first time in Spring 2017.

Demonstrate an understanding of the relationships between structure and behavior of the chemical elements in their various forms and combinations (Departmental Outcome C).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chem Exam. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam Organic sub-category.	1) Mean score on the ACS Organic Chem Exam was 36.45 (–0.23σ). No individuals failed to meet the -1.5σ criterion. 2) Average sub-score on the Organic section of the ETS chemistry exam was 61.0 (+0.89σ). No individuals failed to meet the –1.5σ criterion on the organic section.	1) This data set represents the fifth year in a row that ACS scores have met the departmental criteria for success. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. The introduction of a more rigorous prerequisite for Chem 132 (i.e., Chem 131 grade of C) is awaiting approval by the department pending the implementation of Chem 135 for Zoo & Wildlife Biology Majors in Spring 2017. 2) ETS scores were acceptable this year. The department has opted to not make any changes to the curriculum at this time.
Demonstrate an ability to analyze various kinds of experimental data used in the chemical disciplines including the output of various instrumental techniques (Departmental Outcome E).	1) Each student must obtain a minimum cumulative score of 15 on each of 5 instrumental assignments (i.e., IR/MS/NMR assignments) completed in Chem 322.	All students who passed the class met the minimum score of 15 on all 5 assignments.	Since 2012, a passing grade on each assignment has been officially required in order to pass the class. In Spring 2014, the instructor implemented a policy of assigning a grade of "Incomplete" until all students had met the minimum criteria. As a result, the number of deficient criteria has dropped dramatically. At the encouragement of the Chemistry Program's external reviewers, the departmental chemistry faculty have agreed to add an additional 4 instrumental assignments to the existing slate of 5. The chemistry faculty are hoping to implement these new assignments within the next one or two reporting cycles.
Demonstrate an understanding of the biological characteristics of each of the major kingdoms (Departmental Outcome F)	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Organismal Sub-score.	1) Average Organismal sub-score is 61.1 (+0.60σ). No individuals failed to meet the -1.5σ criterion.	In light of the successful scores of several recent cohorts on the organismal sub-section of the ETS, the department has opted to not make any programmatic changes at this time. Individuals missing the criterion of –1.5σ on other sub-sections or even as composite scores are a concern for us, but legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist. The department is more concerned when students who have acceptable GPAs routinely miss this threshold. This has occasionally happened, but not routinely. The department has slated this as an agenda item for a future departmental meeting.

Demonstrate an understanding of the fundamental concepts of molecular biology and genetics (Departmental Outcome G).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Molecular Biology and Genetics sub-scores.	1) Average Molecular Biology/Genetics sub-score is 58.8 (+0.45σ). Two individuals failed to meet the –1.50σ criterion.	The composite average score was well-above the national average this year. Although this is cause for celebration, individuals missing the criterion of –1.5σ are a concern for us. This has occasionally happened (two this year), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting.
Demonstrate an understanding of the various factors that impact biological populations (Departmental Outcome H).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Population Biology/Evolution/Ecology sub-score.	1) Average Population Biology/Evolution/Ecology sub-score is 60.4 (+0.61σ). All individuals met the -1.5σ criterion.	In light of the successful scores of several recent cohorts on the population biology/evolution/ecology sub-section, the department has opted to not make any programmatic changes at this time. The institutional cohort averages on this section are some of the highest and represent strengths of the department's biology programs.

Demonstrate an ability to properly relate biological structure and function (Departmental Outcome I).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Cell Biology sub-score.	1) Average Cell Biology sub-score is 53.9 (+0.07σ). A single individual failed to meet the –1.5σ criterion.	This sub-section of the ETS has historically been lowest. For this reason, a curricular change was proposed and passed by the full faculty that added one credit hour to the introductory Cell Biology course effective Fall 2012. It is still too early to tell if this curricular change will impact our scores on this section (i.e., Spring 2016 graduating class will be the first to take the ETS having benefited from this curricular change). Individuals missing the criterion of –1.5σ on other sub-sections or even as composite scores are a concern for us. This has occasionally happened (one this year on this sub-section), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Lastly, in last year's report, we indicated that we would like to add an additional instrument to assess this outcome -- a minimum score of 70% on the cell biology content of our in-house biology post-test. This has proved more difficult than at first anticipated and was not completed for this report. Since so many of our curricular/personnel changes should begin impacting the 2016 report data, we are holding off on the new assessment until then as well.
Demonstrate the capability of analyzing and reporting empirical data from the biological sciences (Departmental Outcome K).	Instrument has been dropped in favor of a newer one that has yet to be developed.	NO DATA	Previous reports have indicated that our department has been having a long and rather continuous conversation about the need to implement a research methods course. This course was finally developed and approved by the department and full faculty. It is scheduled to run in Fall 2016 for the first time. The exact nature of the assessment instrument is still in flux, but the department has completed the most difficult step in addressing this shortfall. It will be possible to build an appropriate assessment instrument into the course as it runs in Fall 2016.

Demonstrate the level of content mastery required for potential successful performance in graduate school biology programs or professional schools (Departmental Outcome N).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam composite score. 2) Mean score no lower than 31/50 and no individual score lower than 24/50 on the departmental biology Post-Test	1) Average ETS composite score is 160.1 (+0.53σ). Lowest individual score is 132 (-1.64σ). 2) Mean score on in-house Biology post-test is 34.07. One individual failed to meet the minimum score of 24 (lowest score was 17).	1) As has been the case for several years, the average ETS composite score has been meeting the departmental standard. Occasionally, an individual student fails to meet the minimum score – this happened again this year. The score of 132 in this year's data marks the second lowest ETS composite score ever obtained by a Malone student. Although legitimate reasons for individual students missing the cutoff do exist (e.g., illness, test anxiety), the department has an intuition that it can do more. 2) The score of 17 in this year's data was achieved by the same student that achieved the 132 on the ETS exam. This student obtained a score of 17 on the pre-test as well, and the lack of change, at face value, indicates that this student did not absorb any content knowledge whatsoever. Results of this nature are most unsettling. Several options to address the occasional outlier are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Until the impact of the extra credit hour in Biol 144 and the impact of biology faculty personnel changes are manifested, it seems premature to us to alter the curriculum.

MALONE UNIVERSITY
CHRIST'S KINGDOM FIRST

Program Name: Biochemistry

Assessed by: Jeff Goff, Dept. of Natural Sciences

Date/Cycle of Assessment: Submitted on 10/31/2016;
Reporting cycle of January 2015 – December 2015

Mission Statement:

The Malone University Department of Natural Sciences exists to engage students in the study of God's majesty and character by exploring His handiwork as it is revealed in Nature, both animate and inanimate; to promote the wise and thoughtful stewardship of

the natural resources He has entrusted to us; and to encourage students to demonstrate God's love in their respective communities by using the knowledge and skills they acquire here.

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- Students should become proficient in solving biological and chemical problems using both quantitative and qualitative approaches and in analyzing / interpreting data generated by experimental protocols commonly employed by practicing biologists/chemists (Stems from Malone Educ. Goals C3, D4, and D5).
- Students should be able to apply the principles of Christian Stewardship to biological practice and interpret biological and chemical phenomena within a Christian worldview (Stems from Malone Educ. Goals D2, E1, and E5).

MALONE UNIVERSITY ANNUAL ASSESSMENT REPORT (See Appendix for Raw Data and Detailed Analysis)

Department: *Natural Sciences*
Program: *Biochemistry*
Assessed by: *Jeffrey M. Goff - Dept. of Natural Sciences*
Time Period Covered: *January 2015-December 2015*
Submission Date: *10/31/2016*

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
Demonstrate the capability of integrating data and assessing phenomena within a Christian paradigm (Departmental Outcome A).	1) Average cumulative score ≥ 12; minimum cumulative score of 8; no individual component score of 1 on the Faith and Learning Assessment Instrument as scored by the associated rubric.	Average composite score = 14.41; minimum composite score = 8; # of individual component scores of 1 was 3.	Data here represent the sixth data set ever collected with this instrument. Average composite score and individual composite scores all met the departmental criteria for success. However, 3 individual component scores were not acceptable. Two of the low individual component scores were from a single individual's essays who, we believe, avoided the question due to the sensitivity of the material. As a result, the department reworded the instrument to be less offensive to students whose worldviews differ significantly from Malone's in order to elicit more on-task participation.
Demonstrate a comprehension of the central concepts of chemistry including the major theories and laws which govern chemical phenomena (Departmental Outcome B).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Gen Chem II Exam. 2) ACS Gen Chem II Exam score used as a Pre-Test for obtaining baseline data only (not used to assess success, but merely preparation for freshman chemistry sequence).	1) Mean score on the ACS Gen Chem Exam is 29.14 (-0.80σ). Ten individuals failed to meet the -1.5σ criterion. 2) Class average on ACS Gen Chem pre-test is 18.81 giving strong evidence of student improvement, but the scores of the freshman cohort as it exits is well below the national average (24^{th} percentile)	The 10 low ACS Gen Chem Exam scores and the low average score for the cohort are in keeping with other recent cohorts and are disappointing to the department. The extremely low CCDT results for Fall 2008 - Fall 2010 are evidence that our students enter well below the national average, so cohorts exiting below the national average do not necessarily imply a poor program. The ACS Gen Chem II pre-test scores, when compared to the post-test scores, are extremely strong evidence that our students are improving as a result of our freshman chemistry sequence. The department has concluded that our students enter below the national average and then exit below the national average in spite of the significant improvement in content knowledge. The department responded by developing a new, alternative Gen Chem II course for Zoo and Wildlife Biology Majors. Course is scheduled to run for the first time in Spring 2017.

Demonstrate an understanding of the relationships between structure and behavior of the chemical elements in their various forms and combinations (Departmental Outcome C).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chem Exam. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Inorganic Chem Exam. 3) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam Organic and Inorganic Sub-scores.	1) Mean score on the ACS Organic Chem Exam was 36.45 (–0.23σ). No individuals failed to meet the -1.5σ criterion. 2) Most recent mean score on the ACS Inorganic Chem Exam was 25.67 (–0.33σ). Only 1 individual failed to meet the –1.5σ criterion. 3) Average sub-scores on the Organic and Inorganic sections of the ETS chemistry exam are 61.0 and 56.7 respectively (+0.89σ and +0.56σ respectively). No individuals failed to meet the –1.5σ criterion on either sub-section).	1) This data set represents the fifth year in a row that ACS composite scores have met the departmental criteria for success. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. 2) Composite scores on the ACS Inorganic exam have met the minimum standard set by the department since 2009. The occasional individual still misses the –1.5σ criterion, however. The success of our students on the ETS inorganic sub-section, however, is comforting and leads us to believe that no programmatic changes are warranted at this time. 3) ETS scores were acceptable again this year. The department has opted to not make any changes to the curriculum at this time.
Demonstrate an ability to analyze various kinds of experimental data used in the chemical disciplines including the output of various instrumental techniques (Departmental Outcome E).	1) Each student must obtain a minimum cumulative score of 15 on each of 5 instrumental assignments (i.e., IR/MS/NMR assignments) completed in Chem 322.	All students who passed the class met the minimum score of 15 on all 5 assignments.	Since 2012, a passing grade on each assignment has been officially required in order to pass the class. In Spring 2014, the instructor implemented a policy of assigning a grade of "Incomplete" until all students had met the minimum criteria. As a result, the number of deficient criteria has dropped dramatically. At the encouragement of the Chemistry Program's external reviewers, the departmental chemistry faculty have agreed to add an additional 4 instrumental assignments to the existing slate of 5. The chemistry faculty are hoping to implement these new assignments within the next one or two reporting cycles.

Demonstrate an understanding of the fundamental concepts of molecular biology and genetics (Departmental Outcome G).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Molecular Biology and Genetics sub-scores.	1) Average Molecular Biology/Genetics sub-score is 58.8 (+0.45σ). Two individuals failed to meet the –1.50σ criterion.	The composite average score was well-above the national average this year. Although this is cause for celebration, individuals missing the criterion of –1.5σ are a concern for us. This has occasionally happened (two this year), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting.
Demonstrate an ability to properly relate biological structure and function (Departmental Outcome I).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Cell Biology sub-score.	1) Average Cell Biology sub-score is 53.9 (+0.07σ). A single individual failed to meet the –1.5σ criterion.	This sub-section of the ETS has historically been lowest. For this reason, a curricular change was proposed and passed by the full faculty that added one credit hour to the introductory Cell Biology course effective Fall 2012. It is still too early to tell if this curricular change will impact our scores on this section (i.e., Spring 2016 graduating class will be the first to take the ETS having benefited from this curricular change). Individuals missing the criterion of –1.5σ on other sub-sections or even as composite scores are a concern for us. This has occasionally happened (one this year on this sub-section), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Lastly, in last year's report, we indicated that we would like to add an additional instrument to assess this outcome -- a minimum score of 70% on the cell biology content of our in-house biology post-test. This has proved more difficult than at first anticipated and was not completed for this report. We are holding off on the new assessment until 2016.
Demonstrate the capability of analyzing and reporting empirical data from the biological sciences (Departmental Outcome K).	Instrument has been dropped in favor of a newer one that has yet to be developed.	NO DATA	Previous reports have indicated that our department has been having a long and rather continuous conversation about the need to implement a research methods course. This course was finally developed and approved by the department and full faculty. It is scheduled to run in Fall 2016 for the first time. The exact nature of the assessment instrument is still in flux, but the department has completed the most difficult step in addressing this shortfall.

			It will be possible to build an appropriate assessment instrument into the course as it runs in Fall 2016.
Demonstrate the level of content mastery required for potential successful performance in graduate school biology programs or professional schools (Departmental Outcome N).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam composite score. 2) Mean score no lower than 31/50 and no individual score lower than 24/50 on the departmental biology Post-Test	1) Average ETS composite score is 160.1 (+0.53σ). Lowest individual score is 132 (-1.64σ). 2) Mean score on in-house Biology post-test is 34.07. One individual failed to meet the minimum score of 24 (lowest score was 17).	1) As has been the case for several years, the average ETS composite score has been meeting the departmental standard. Occasionally, an individual student fails to meet the minimum score – this happened again this year. The score of 132 in this year's data marks the second lowest ETS composite score ever obtained by a Malone student. Although legitimate reasons for individual students missing the cutoff do exist (e.g., illness, test anxiety), the department has an intuition that it can do more. 2) The score of 17 in this year's data was achieved by the same student that achieved the 132 on the ETS exam. This student obtained a score of 17 on the pre-test as well, and the lack of change, at face value, indicates that this student did not absorb any content knowledge whatsoever. Results of this nature are most unsettling. Several options to address the occasional outlier are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Until the impact of the extra credit hour in Biol 144 and the impact of biology faculty personnel changes are manifested, it seems premature to us to alter the curriculum.
Demonstrate the level of content mastery required for potential successful performance in chemical industry, graduate school chemistry programs, or professional schools (Departmental Outcome P).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam composite score. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chemistry exam.	1) Mean ETS composite score is 155.7. (+0.51σ). No individuals failed to meet the -1.5σ criterion. 2) Mean score on the ACS Organic Chem Exam was 36.45 (–0.23σ). No individuals failed to meet the -1.5σ criterion.	1) ETS Composite data have been acceptable for the last several years. 2) This data set represents the fifth year in a row that ACS scores have met the departmental criteria for success in organic. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. No changes appear to be warranted at this time.

Program Name: Biology (General Track)

Assessed by: Jeff Goff, Dept. of Natural Sciences

Date/Cycle of Assessment: Submitted on 10/31/2016;
Reporting cycle of January 2015 – December 2015

Mission Statement:

The Malone University Department of Natural Sciences exists to engage students in the study of God's majesty and character by exploring His handiwork as it is revealed in Nature, both animate and inanimate; to promote the wise and thoughtful stewardship of the natural resources He has entrusted to us; and to encourage students to demonstrate God's love in their respective communities by using the knowledge and skills they acquire here.

Program Goals:

- Students should comprehend the central concepts of biology, the underlying assumptions of biological knowledge, and be able to employ the methods of inquiry commonly utilized by practicing biologists at a level sufficient for entrance into graduate school, professional schools, and other biological vocations (Stems from Malone Educ. Goals A4, D1, and D3).
- Students should become proficient in solving biological problems using both quantitative and qualitative approaches and in analyzing / interpreting data generated by experimental protocols commonly employed by practicing biologists (Stems from Malone Educ. Goals C3, D4, and D5).
- Students should be able to apply the principles of Christian Stewardship to biological practice and interpret biological phenomena within a Christian worldview (Stems from Malone Educ. Goals D2, E1, and E5).

MALONE UNIVERSITY ANNUAL ASSESSMENT REPORT (See Appendix for Raw Data and Detailed Analysis)

Department: *Natural Sciences*
Program: *Biology (General Track)*
Assessed by: *Jeffrey M. Goff - Dept. of Natural Sciences*
Time Period Covered: *January 2015-December 2015*
Submission Date: *10/31/2016*

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
Demonstrate the capability of integrating data and assessing phenomena within a Christian paradigm (Departmental Outcome A).	1) Average cumulative score ≥ 12; minimum cumulative score of 8; no individual component score of 1 on the Faith and Learning Assessment Instrument as scored by the associated rubric.	Average composite score = 14.41; minimum composite score = 8; # of individual component scores of 1 was 3.	Data here represent the sixth data set ever collected with this instrument. Average composite score and individual composite scores all met the departmental criteria for success. However, 3 individual component scores were not acceptable. Two of the low individual component scores were from a single individual's essays who, we believe, avoided the question due to the sensitivity of the material. As a result, the department reworded the instrument to be less offensive to students whose worldviews differ significantly from Malone's in order to elicit more on-task participation.
Demonstrate a comprehension of the central concepts of chemistry including the major theories and laws which govern chemical phenomena (Departmental Outcome B).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Gen Chem II Exam. 2) ACS Gen Chem II Exam score used as a Pre-Test for obtaining baseline data only (not used to assess success, but merely preparation for freshman chemistry sequence).	1) Mean score on the ACS Gen Chem Exam is 29.14 (-0.80σ). Ten individuals failed to meet the -1.5σ criterion. 2) Class average on ACS Gen Chem pre-test is 18.81 giving strong evidence of student improvement, but the scores of the freshman cohort as it exits is well below the national average (24^{th} percentile)	The 10 low ACS Gen Chem Exam scores and the low average score for the cohort are in keeping with other recent cohorts and are disappointing to the department. The extremely low CCDT results for Fall 2008 - Fall 2010 are evidence that our students enter well below the national average, so cohorts exiting below the national average do not necessarily imply a poor program. The ACS Gen Chem II pre-test scores, when compared to the post-test scores, are extremely strong evidence that our students are improving as a result of our freshman chemistry sequence. The department has concluded that our students enter below the national average and then exit below the national average in spite of the significant improvement in content knowledge. The department responded by developing a new, alternative Gen Chem II course for Zoo and Wildlife Biology Majors. Course is scheduled to run for the first time in Spring 2017.

Demonstrate an understanding of the biological characteristics of each of the major kingdoms (Departmental Outcome F)	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Organismal Sub-score.	1) Average Organismal sub-score is 61.1 (+0.60σ). No individuals failed to meet the –1.5σ criterion.	In light of the successful scores of several recent cohorts on the organismal sub-section of the ETS, the department has opted to not make any programmatic changes at this time. Individuals missing the criterion of –1.5σ on other sub-sections or even as composite scores are a concern for us, but legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist. The department is more concerned when students who have acceptable GPAs routinely miss this threshold. This has occasionally happened, but not routinely. The department has slated this as an agenda item for a future departmental meeting.
Demonstrate an understanding of the fundamental concepts of molecular biology and genetics (Departmental Outcome G).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Molecular Biology and Genetics sub-scores.	1) Average Molecular Biology/Genetics sub-score is 58.8 (+0.45σ). Two individuals failed to meet the –1.50σ criterion.	The composite average score was well-above the national average this year. Although this is cause for celebration, individuals missing the criterion of –1.5σ are a concern for us. This has occasionally happened (two this year), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting.

Demonstrate an understanding of the various factors that impact biological populations (Departmental Outcome H).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Population Biology/Evolution/Ecology sub-score.	1) Average Population Biology/Evolution/Ecology sub-score is 60.4 (+0.61σ). All individuals met the -1.5σ criterion.	In light of the successful scores of several recent cohorts on the population biology/evolution/ecology sub-section, the department has opted to not make any programmatic changes at this time. The institutional cohort averages on this section are some of the highest and represent strengths of the department's biology programs.
Demonstrate an ability to properly relate biological structure and function (Departmental Outcome I).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Cell Biology sub-score.	1) Average Cell Biology sub-score is 53.9 (+0.07σ). A single individual failed to meet the –1.5σ criterion.	This sub-section of the ETS has historically been lowest. For this reason, a curricular change was proposed and passed by the full faculty that added one credit hour to the introductory Cell Biology course effective Fall 2012. It is still too early to tell if this curricular change will impact our scores on this section (i.e., Spring 2016 graduating class will be the first to take the ETS having benefited from this curricular change). Individuals missing the criterion of –1.5σ on other sub-sections or even as composite scores are a concern for us. This has occasionally happened (one this year on this sub-section), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Lastly, in last year's report, we indicated that we would like to add an additional instrument to assess this outcome -- a minimum score of 70% on the cell biology content of our in-house biology post-test. This has proved more difficult than at first anticipated and was not completed for this report. Since so many of our curricular/personnel changes should begin impacting the 2016 report data, we are holding off on the new assessment until then as well.

Demonstrate the capability of analyzing and reporting empirical data from the biological sciences (Departmental Outcome K).	Instrument has been dropped in favor of a newer one that has yet to be developed.	NO DATA	Previous reports have indicated that our department has been having a long and rather continuous conversation about the need to implement a research methods course. This course was finally developed and approved by the department and full faculty. It is scheduled to run in Fall 2016 for the first time. The exact nature of the assessment instrument is still in flux, but the department has completed the most difficult step in addressing this shortfall. It will be possible to build an appropriate assessment instrument into the course as it runs in Fall 2016.
Demonstrate the level of content mastery required for potential successful performance in graduate school biology programs or professional schools (Departmental Outcome N).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam composite score. 2) Mean score no lower than 31/50 and no individual score lower than 24/50 on the departmental biology Post-Test	1) Average ETS composite score is 160.1 (+0.53σ). Lowest individual score is 132 (-1.64σ). 2) Mean score on in-house Biology post-test is 34.07. One individual failed to meet the minimum score of 24 (lowest score was 17).	1) As has been the case for several years, the average ETS composite score has been meeting the departmental standard. Occasionally, an individual student fails to meet the minimum score – this happened again this year. The score of 132 in this year's data marks the second lowest ETS composite score ever obtained by a Malone student. Although legitimate reasons for individual students missing the cutoff do exist (e.g., illness, test anxiety), the department has an intuition that it can do more. 2) The score of 17 in this year's data was achieved by the same student that achieved the 132 on the ETS exam. This student obtained a score of 17 on the pre-test as well, and the lack of change, at face value, indicates that this student did not absorb any content knowledge whatsoever. Results of this nature are most unsettling. Several options to address the occasional outlier are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Until the impact of the extra credit hour in Biol 144 and the impact of biology faculty personnel changes are manifested, it seems premature to us to alter the curriculum.

Program Name: Biology (Pre-Optometry track)

Assessed by: Jeff Goff, Dept. of Natural Sciences

Date/Cycle of Assessment: Submitted on 10/31/2016;
Reporting cycle of January 2015 – December 2015

Mission Statement:

The Malone University Department of Natural Sciences exists to engage students in the study of God's majesty and character by exploring His handiwork as it is revealed in Nature, both animate and inanimate; to promote the wise and thoughtful stewardship of the natural resources He has entrusted to us; and to encourage students to demonstrate God's love in their respective communities by using the knowledge and skills they acquire here.

Program Goals:

- Students should comprehend the central concepts of biology and chemistry, the underlying assumptions of biological knowledge and chemical knowledge, and be able to employ the methods of inquiry commonly utilized by practicing biologists and chemists at a level sufficient for entrance into graduate school, professional schools, and other biological vocations (Stems from Malone Educ. Goals A4, D1, and D3).
- Students should become proficient in solving biological and chemical problems using both quantitative and qualitative approaches and in analyzing / interpreting data generated by experimental protocols commonly employed by practicing biologists/chemists (Stems from Malone Educ. Goals C3, D4, and D5).
- Students should be able to apply the principles of Christian Stewardship to biological practice and interpret biological and chemical phenomena within a Christian worldview (Stems from Malone Educ. Goals D2, E1, and E5).

- Students should develop an enriched understanding of the nature of human identity, development, and behavior through a study of human anatomy and physiology. (Stems from Malone Educ. Goal A3)

MALONE UNIVERSITY ANNUAL ASSESSMENT REPORT (See Appendix for Raw Data and Detailed Analysis)

Department: *Natural Sciences*
Program: *Biology (Pre-Optometry Track)*
Assessed by: *Jeffrey M. Goff - Dept. of Natural Sciences*
Time Period Covered: *January 2015-December 2015*
Submission Date: *10/31/2016*

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
Demonstrate the capability of integrating data and assessing phenomena within a Christian paradigm (Departmental Outcome A).	1) Average cumulative score ≥ 12; minimum cumulative score of 8; no individual component score of 1 on the Faith and Learning Assessment Instrument as scored by the associated rubric.	Average composite score = 14.41; minimum composite score = 8; # of individual component scores of 1 was 3.	Data here represent the sixth data set ever collected with this instrument. Average composite score and individual composite scores all met the departmental criteria for success. However, 3 individual component scores were not acceptable. Two of the low individual component scores were from a single individual's essays who, we believe, avoided the question due to the sensitivity of the material. As a result, the department reworded the instrument to be less offensive to students whose worldviews differ significantly from Malone's in order to elicit more on-task participation.
Demonstrate a comprehension of the central concepts of chemistry including the major theories and laws which govern chemical phenomena (Departmental Outcome B).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Gen Chem II Exam. 2) ACS Gen Chem II Exam score used as a Pre-Test for obtaining baseline data only (not used to assess success, but merely preparation for freshman chemistry sequence).	1) Mean score on the ACS Gen Chem Exam is 29.14 (-0.80σ). Ten individuals failed to meet the -1.5σ criterion. 2) Class average on ACS Gen Chem pre-test is 18.81 giving strong evidence of student improvement, but the scores of the freshman cohort as it exits is well below the national average (24^{th} percentile)	The 10 low ACS Gen Chem Exam scores and the low average score for the cohort are in keeping with other recent cohorts and are disappointing to the department. The extremely low CCDT results for Fall 2008 - Fall 2010 are evidence that our students enter well below the national average, so cohorts exiting below the national average do not necessarily imply a poor program. The ACS Gen Chem II pre-test scores, when compared to the post-test scores, are extremely strong evidence that our students are improving as a result of our freshman chemistry sequence. The department has concluded that our students enter below the national average and then exit below the national average in spite of the significant improvement in content knowledge. The department responded by developing a new, alternative Gen Chem II course for Zoo and Wildlife Biology Majors. Course is scheduled to run for the first time in Spring 2017.

Demonstrate an understanding of the relationships between structure and behavior of the chemical elements in their various forms and combinations (Departmental Outcome C).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chem Exam. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam Organic sub-category.	1) Mean score on the ACS Organic Chem Exam was 36.45 (–0.23σ). No individuals failed to meet the -1.5σ criterion. 2) Average sub-score on the Organic section of the ETS chemistry exam was 61.0 (+0.89σ). No individuals failed to meet the –1.5σ criterion on the organic section.	1) This data set represents the fifth year in a row that ACS scores have met the departmental criteria for success. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. The introduction of a more rigorous prerequisite for Chem 132 (i.e., Chem 131 grade of C) is awaiting approval by the department pending the implementation of Chem 135 for Zoo & Wildlife Biology Majors in Spring 2017. 2) ETS scores were acceptable this year. The department has opted to not make any changes to the curriculum at this time.
Demonstrate an ability to analyze various kinds of experimental data used in the chemical disciplines including the output of various instrumental techniques (Departmental Outcome E).	1) Each student must obtain a minimum cumulative score of 15 on each of 5 instrumental assignments (i.e., IR/MS/NMR assignments) completed in Chem 322.	All students who passed the class met the minimum score of 15 on all 5 assignments.	Since 2012, a passing grade on each assignment has been officially required in order to pass the class. In Spring 2014, the instructor implemented a policy of assigning a grade of "Incomplete" until all students had met the minimum criteria. As a result, the number of deficient criteria has dropped dramatically. At the encouragement of the Chemistry Program's external reviewers, the departmental chemistry faculty have agreed to add an additional 4 instrumental assignments to the existing slate of 5. The chemistry faculty are hoping to implement these new assignments within the next one or two reporting cycles.
Demonstrate an understanding of the biological characteristics of each of the major kingdoms (Departmental Outcome F)	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Organismal Sub-score.	1) Average Organismal sub-score is 61.1 (+0.60σ). No individuals failed to meet the -1.5σ criterion.	In light of the successful scores of several recent cohorts on the organismal sub-section of the ETS, the department has opted to not make any programmatic changes at this time. Individuals missing the criterion of –1.5σ on other sub-sections or even as composite scores are a concern for us, but legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist. The department is more concerned when students who have acceptable GPAs routinely miss this threshold. This has occasionally happened, but not routinely. The department has slated this as an agenda item for a future departmental meeting.

Demonstrate an understanding of the fundamental concepts of molecular biology and genetics (Departmental Outcome G).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Molecular Biology and Genetics sub-scores.	1) Average Molecular Biology/Genetics sub-score is 58.8 (+0.45σ). Two individuals failed to meet the –1.50σ criterion.	The composite average score was well-above the national average this year. Although this is cause for celebration, individuals missing the criterion of –1.5σ are a concern for us. This has occasionally happened (two this year), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting.
Demonstrate an ability to properly relate biological structure and function (Departmental Outcome I).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Cell Biology sub-score.	1) Average Cell Biology sub-score is 53.9 (+0.07σ). A single individual failed to meet the –1.5σ criterion.	This sub-section of the ETS has historically been lowest. For this reason, a curricular change was proposed and passed by the full faculty that added one credit hour to the introductory Cell Biology course effective Fall 2012. It is still too early to tell if this curricular change will impact our scores on this section (i.e., Spring 2016 graduating class will be the first to take the ETS having benefited from this curricular change). Individuals missing the criterion of –1.5σ on other sub-sections or even as composite scores are a concern for us. This has occasionally happened (one this year on this sub-section), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Lastly, in last year's report, we indicated that we would like to add an additional instrument to assess this outcome -- a minimum score of 70% on the cell biology content of our in-house biology post-test. This has proved more difficult than at first anticipated and was not completed for this report. We are holding off on the new assessment until 2016.
Demonstrate the capability of analyzing and reporting empirical data from the biological sciences (Departmental Outcome K).	Instrument has been dropped in favor of a newer one that has yet to be developed.	NO DATA	Previous reports have indicated that our department has been having a long and rather continuous conversation about the need to implement a research methods course. This course was finally developed and approved by the department and full faculty. It is scheduled to run in Fall 2016 for the first time. The exact nature of the assessment instrument is still in flux, but the department has completed the most difficult step in addressing this shortfall. It will be possible to build an appropriate assessment instrument into the course as it runs in Fall 2016.

Demonstrate a balanced concept of molecular, micro, and macro levels of biological phenomena in the context of human systems (Departmental Outcome L).	1) Mean score no lower than 8/12 on the A&P questions of the in-house biology post-test. No individual with a score lower than 5/12. (Note: New instrument – criteria are still being evaluated).	1) NO DATA for this reporting period.	Although Biol 132 exam scores were retained for several years with the goal of extracting the scores of our graduates from the overwhelming number of nursing students who took the course, the retirement of our A&P instructor has caused us to change course. The current in-house biology pre-test / post-test exam has been altered to accommodate roughly 12 questions covering human A&P content. The performance of our biology pre-professional students on these 12 questions will be used to show improvement in human A&P content knowledge. The first administration of this altered exam was tentatively scheduled for Spring 2015, but did not occur until Fall 2016. Preliminary data will be included in the 2016 assessment report. The current A&P instructor is also researching an additional assessment that might allow for true comparisons with national averages.
Demonstrate the ability to properly relate biological structure and function in the context of human systems (Departmental Outcome M).	1) Mean score no lower than 8/12 on the A&P questions of the in-house biology post-test. No individual with a score lower than 5/12. (Note: New instrument – criteria are still being evaluated).	1) NO DATA for this reporting period.	See comments in table cell for Departmental PILO 'L'.
Demonstrate the level of content mastery required for potential successful performance in graduate school biology programs or professional schools (Departmental Outcome N).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam composite score. 2) Mean score no lower than 31/50 and no individual score lower than 24/50 on the departmental biology Post-Test	1) Average ETS composite score is 160.1 (+0.53σ). Lowest individual score is 132 (-1.64σ). 2) Mean score on in-house Biology post-test is 34.07. One individual failed to meet the minimum score of 24 (lowest score was 17).	1) As has been the case for several years, the average ETS composite score has been meeting the departmental standard. Occasionally, an individual student fails to meet the minimum score – this happened again this year. The score of 132 in this year's data marks the second lowest ETS composite score ever obtained by a Malone student. Although legitimate reasons for individual students missing the cutoff do exist (e.g., illness, test anxiety), the department has an intuition that it can do more. 2) The score of 17 in this year's data was achieved by the same student that achieved the 132 on the ETS exam. This student obtained a score of 17 on the pre-test as well, and the lack of change, at face value, indicates that this student did not absorb any content knowledge whatsoever. Results of this nature are most unsettling. Several options to address the occasional outlier are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Until the impact of the extra credit hour in Biol 144 and the impact of biology faculty personnel changes are manifested, it seems premature to us to alter the curriculum.

Program Name: Biology (Pre-Physician's Assistant Track)

Assessed by: Jeff Goff, Dept. of Natural Sciences

Date/Cycle of Assessment: Submitted on 10/31/2016;
Reporting cycle of January 2015 – December 2015

Mission Statement:

The Malone University Department of Natural Sciences exists to engage students in the study of God's majesty and character by exploring His handiwork as it is revealed in Nature, both animate and inanimate; to promote the wise and thoughtful stewardship of the natural resources He has entrusted to us; and to encourage students to demonstrate God's love in their respective communities by using the knowledge and skills they acquire here.

Program Goals:

- Students should comprehend the central concepts of biology and chemistry, the underlying assumptions of biological knowledge and chemical knowledge, and be able to employ the methods of inquiry commonly utilized by practicing biologists and chemists at a level sufficient for entrance into graduate school, professional schools, and other biological vocations (Stems from Malone Educ. Goals A4, D1, and D3).
- Students should become proficient in solving biological and chemical problems using both quantitative and qualitative approaches and in analyzing / interpreting data generated by experimental protocols commonly employed by practicing biologists/chemists (Stems from Malone Educ. Goals C3, D4, and D5).
- Students should be able to apply the principles of Christian Stewardship to biological practice and interpret biological and chemical phenomena within a Christian worldview (Stems from Malone Educ. Goals D2, E1, and E5).

- Students should develop an enriched understanding of the nature of human identity, development, and behavior through a study of human anatomy and physiology. (Stems from Malone Educ. Goal A3)

MALONE UNIVERSITY ANNUAL ASSESSMENT REPORT (See Appendix for Raw Data and Detailed Analysis)

Department: *Natural Sciences*
Program: *Biology (Pre-Physician's Assistant Track)*
Assessed by: *Jeffrey M. Goff - Dept. of Natural Sciences*
Time Period Covered: *January 2015-December 2015*
Submission Date: *10/31/2016*

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
Demonstrate the capability of integrating data and assessing phenomena within a Christian paradigm (Departmental Outcome A).	1) Average cumulative score ≥ 12; minimum cumulative score of 8; no individual component score of 1 on the Faith and Learning Assessment Instrument as scored by the associated rubric.	Average composite score = 14.41; minimum composite score = 8; # of individual component scores of 1 was 3.	Data here represent the sixth data set ever collected with this instrument. Average composite score and individual composite scores all met the departmental criteria for success. However, 3 individual component scores were not acceptable. Two of the low individual component scores were from a single individual's essays who, we believe, avoided the question due to the sensitivity of the material. As a result, the department reworded the instrument to be less offensive to students whose worldviews differ significantly from Malone's in order to elicit more on-task participation.
Demonstrate a comprehension of the central concepts of chemistry including the major theories and laws which govern chemical phenomena (Departmental Outcome B).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Gen Chem II Exam. 2) ACS Gen Chem II Exam score used as a Pre-Test for obtaining baseline data only (not used to assess success, but merely preparation for freshman chemistry sequence).	1) Mean score on the ACS Gen Chem Exam is 29.14 (-0.80σ). Ten individuals failed to meet the -1.5σ criterion. 2) Class average on ACS Gen Chem pre-test is 18.81 giving strong evidence of student improvement, but the scores of the freshman cohort as it exits is well below the national average (24^{th} percentile)	The 10 low ACS Gen Chem Exam scores and the low average score for the cohort are in keeping with other recent cohorts and are disappointing to the department. The extremely low CCDT results for Fall 2008 - Fall 2010 are evidence that our students enter well below the national average, so cohorts exiting below the national average do not necessarily imply a poor program. The ACS Gen Chem II pre-test scores, when compared to the post-test scores, are extremely strong evidence that our students are improving as a result of our freshman chemistry sequence. The department has concluded that our students enter below the national average and then exit below the national average in spite of the significant improvement in content knowledge. The department responded by developing a new, alternative Gen Chem II course for Zoo and Wildlife Biology Majors. Course is scheduled to run for the first time in Spring 2017.

Demonstrate an understanding of the relationships between structure and behavior of the chemical elements in their various forms and combinations (Departmental Outcome C).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chem Exam. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam Organic sub-category.	1) Mean score on the ACS Organic Chem Exam was 36.45 (–0.23σ). No individuals failed to meet the -1.5σ criterion. 2) Average sub-score on the Organic section of the ETS chemistry exam was 61.0 (+0.89σ). No individuals failed to meet the –1.5σ criterion on the organic section.	1) This data set represents the fifth year in a row that ACS scores have met the departmental criteria for success. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. The introduction of a more rigorous prerequisite for Chem 132 (i.e., Chem 131 grade of C) is awaiting approval by the department pending the implementation of Chem 135 for Zoo & Wildlife Biology Majors in Spring 2017. 2) ETS scores were acceptable this year. The department has opted to not make any changes to the curriculum at this time.
Demonstrate an ability to analyze various kinds of experimental data used in the chemical disciplines including the output of various instrumental techniques (Departmental Outcome E).	1) Each student must obtain a minimum cumulative score of 15 on each of 5 instrumental assignments (i.e., IR/MS/NMR assignments) completed in Chem 322.	All students who passed the class met the minimum score of 15 on all 5 assignments.	Since 2012, a passing grade on each assignment has been officially required in order to pass the class. In Spring 2014, the instructor implemented a policy of assigning a grade of "Incomplete" until all students had met the minimum criteria. As a result, the number of deficient criteria has dropped dramatically. At the encouragement of the Chemistry Program's external reviewers, the departmental chemistry faculty have agreed to add an additional 4 instrumental assignments to the existing slate of 5. The chemistry faculty are hoping to implement these new assignments within the next one or two reporting cycles.
Demonstrate an understanding of the biological characteristics of each of the major kingdoms (Departmental Outcome F)	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Organismal Sub-score.	1) Average Organismal sub-score is 61.1 (+0.60σ). No individuals failed to meet the -1.5σ criterion.	In light of the successful scores of several recent cohorts on the organismal sub-section of the ETS, the department has opted to not make any programmatic changes at this time. Individuals missing the criterion of –1.5σ on other sub-sections or even as composite scores are a concern for us, but legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist. The department is more concerned when students who have acceptable GPAs routinely miss this threshold. This has occasionally happened, but not routinely. The department has slated this as an agenda item for a future departmental meeting.

Demonstrate an understanding of the fundamental concepts of molecular biology and genetics (Departmental Outcome G).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Molecular Biology and Genetics sub-scores.	1) Average Molecular Biology/Genetics sub-score is 58.8 (+0.45σ). Two individuals failed to meet the –1.50σ criterion.	The composite average score was well-above the national average this year. Although this is cause for celebration, individuals missing the criterion of –1.5σ are a concern for us. This has occasionally happened (two this year), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting.
Demonstrate an ability to properly relate biological structure and function (Departmental Outcome I).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Cell Biology sub-score.	1) Average Cell Biology sub-score is 53.9 (+0.07σ). A single individual failed to meet the –1.5σ criterion.	This sub-section of the ETS has historically been lowest. For this reason, a curricular change was proposed and passed by the full faculty that added one credit hour to the introductory Cell Biology course effective Fall 2012. It is still too early to tell if this curricular change will impact our scores on this section (i.e., Spring 2016 graduating class will be the first to take the ETS having benefited from this curricular change). Individuals missing the criterion of –1.5σ on other sub-sections or even as composite scores are a concern for us. This has occasionally happened (one this year on this sub-section), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Lastly, in last year's report, we indicated that we would like to add an additional instrument to assess this outcome -- a minimum score of 70% on the cell biology content of our in-house biology post-test. This has proved more difficult than at first anticipated and was not completed for this report. We are holding off on the new assessment until 2016.
Demonstrate the capability of analyzing and reporting empirical data from the biological sciences (Departmental Outcome K).	Instrument has been dropped in favor of a newer one that has yet to be developed.	NO DATA	Previous reports have indicated that our department has been having a long and rather continuous conversation about the need to implement a research methods course. This course was finally developed and approved by the department and full faculty. It is scheduled to run in Fall 2016 for the first time. The exact nature of the assessment instrument is still in flux, but the department has completed the most difficult step in addressing this shortfall. It will be possible to build an appropriate assessment instrument into the course as it runs in Fall 2016.

Demonstrate a balanced concept of molecular, micro, and macro levels of biological phenomena in the context of human systems (Departmental Outcome L).	1) Mean score no lower than 8/12 on the A&P questions of the in-house biology post-test. No individual with a score lower than 5/12. (Note: New instrument – criteria are still being evaluated).	1) NO DATA for this reporting period.	Although Biol 132 exam scores were retained for several years with the goal of extracting the scores of our graduates from the overwhelming number of nursing students who took the course, the retirement of our A&P instructor has caused us to change course. The current in-house biology pre-test / post-test exam has been altered to accommodate roughly 12 questions covering human A&P content. The performance of our biology pre-professional students on these 12 questions will be used to show improvement in human A&P content knowledge. The first administration of this altered exam was tentatively scheduled for Spring 2015, but did not occur until Fall 2016. Preliminary data will be included in the 2016 assessment report. The current A&P instructor is also researching an additional assessment that might allow for true comparisons with national averages.
Demonstrate the ability to properly relate biological structure and function in the context of human systems (Departmental Outcome M).	1) Mean score no lower than 8/12 on the A&P questions of the in-house biology post-test. No individual with a score lower than 5/12. (Note: New instrument – criteria are still being evaluated).	1) NO DATA for this reporting period.	See comments in table cell for Departmental PILO 'L'.
Demonstrate the level of content mastery required for potential successful performance in graduate school biology programs or professional schools (Departmental Outcome N).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam composite score. 2) Mean score no lower than 31/50 and no individual score lower than 24/50 on the departmental biology Post-Test	1) Average ETS composite score is 160.1 (+0.53σ). Lowest individual score is 132 (-1.64σ). 2) Mean score on in-house Biology post-test is 34.07. One individual failed to meet the minimum score of 24 (lowest score was 17).	1) As has been the case for several years, the average ETS composite score has been meeting the departmental standard. Occasionally, an individual student fails to meet the minimum score – this happened again this year. The score of 132 in this year's data marks the second lowest ETS composite score ever obtained by a Malone student. Although legitimate reasons for individual students missing the cutoff do exist (e.g., illness, test anxiety), the department has an intuition that it can do more. 2) The score of 17 in this year's data was achieved by the same student that achieved the 132 on the ETS exam. This student obtained a score of 17 on the pre-test as well, and the lack of change, at face value, indicates that this student did not absorb any content knowledge whatsoever. Results of this nature are most unsettling. Several options to address the occasional outlier are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Until the impact of the extra credit hour in Biol 144 and the impact of biology faculty personnel changes are manifested, it seems premature to us to alter the curriculum.

Program Name: Biology (Pre-Veterinary Medicine track)

Assessed by: Jeff Goff, Dept. of Natural Sciences

Date/Cycle of Assessment: Submitted on 10/31/2016;
Reporting cycle of January 2015 – December 2015

Mission Statement:

The Malone University Department of Natural Sciences exists to engage students in the study of God's majesty and character by exploring His handiwork as it is revealed in Nature, both animate and inanimate; to promote the wise and thoughtful stewardship of the natural resources He has entrusted to us; and to encourage students to demonstrate God's love in their respective communities by using the knowledge and skills they acquire here.

Program Goals:

- Students should comprehend the central concepts of biology and chemistry, the underlying assumptions of biological knowledge and chemical knowledge, and be able to employ the methods of inquiry commonly utilized by practicing biologists and chemists at a level sufficient for entrance into graduate school, professional schools, and other biological vocations (Stems from Malone Educ. Goals A4, D1, and D3).
- Students should become proficient in solving biological and chemical problems using both quantitative and qualitative approaches and in analyzing / interpreting data generated by experimental protocols commonly employed by practicing biologists/chemists (Stems from Malone Educ. Goals C3, D4, and D5).
- Students should be able to apply the principles of Christian Stewardship to biological practice and interpret biological and chemical phenomena within a Christian worldview (Stems from Malone Educ. Goals D2, E1, and E5).

- Students should develop an enriched understanding of the nature of human identity, development, and behavior through a study of human anatomy and physiology. (Stems from Malone Educ. Goal A3)

MALONE UNIVERSITY ANNUAL ASSESSMENT REPORT (See Appendix for Raw Data and Detailed Analysis)

Department: *Natural Sciences*
Program: *Biology (Pre-Veterinary Medicine Track)*
Assessed by: *Jeffrey M. Goff - Dept. of Natural Sciences*
Time Period Covered: *January 2015-December 2015*
Submission Date: *10/31/2016*

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
Demonstrate the capability of integrating data and assessing phenomena within a Christian paradigm (Departmental Outcome A).	1) Average cumulative score ≥ 12; minimum cumulative score of 8; no individual component score of 1 on the Faith and Learning Assessment Instrument as scored by the associated rubric.	Average composite score = 14.41; minimum composite score = 8; # of individual component scores of 1 was 3.	Data here represent the sixth data set ever collected with this instrument. Average composite score and individual composite scores all met the departmental criteria for success. However, 3 individual component scores were not acceptable. Two of the low individual component scores were from a single individual's essays who, we believe, avoided the question due to the sensitivity of the material. As a result, the department reworded the instrument to be less offensive to students whose worldviews differ significantly from Malone's in order to elicit more on-task participation.
Demonstrate a comprehension of the central concepts of chemistry including the major theories and laws which govern chemical phenomena (Departmental Outcome B).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Gen Chem II Exam. 2) ACS Gen Chem II Exam score used as a Pre-Test for obtaining baseline data only (not used to assess success, but merely preparation for freshman chemistry sequence).	1) Mean score on the ACS Gen Chem Exam is 29.14 (-0.80σ). Ten individuals failed to meet the -1.5σ criterion. 2) Class average on ACS Gen Chem pre-test is 18.81 giving strong evidence of student improvement, but the scores of the freshman cohort as it exits is well below the national average (24^{th} percentile)	The 10 low ACS Gen Chem Exam scores and the low average score for the cohort are in keeping with other recent cohorts and are disappointing to the department. The extremely low CCDT results for Fall 2008 - Fall 2010 are evidence that our students enter well below the national average, so cohorts exiting below the national average do not necessarily imply a poor program. The ACS Gen Chem II pre-test scores, when compared to the post-test scores, are extremely strong evidence that our students are improving as a result of our freshman chemistry sequence. The department has concluded that our students enter below the national average and then exit below the national average in spite of the significant improvement in content knowledge. The department responded by developing a new, alternative Gen Chem II course for Zoo and Wildlife Biology Majors. Course is scheduled to run for the first time in Spring 2017.

Demonstrate an understanding of the relationships between structure and behavior of the chemical elements in their various forms and combinations (Departmental Outcome C).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chem Exam. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam Organic sub-category.	1) Mean score on the ACS Organic Chem Exam was 36.45 (–0.23σ). No individuals failed to meet the -1.5σ criterion. 2) Average sub-score on the Organic section of the ETS chemistry exam was 61.0 (+0.89σ). No individuals failed to meet the –1.5σ criterion on the organic section.	1) This data set represents the fifth year in a row that ACS scores have met the departmental criteria for success. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. The introduction of a more rigorous prerequisite for Chem 132 (i.e., Chem 131 grade of C) is awaiting approval by the department pending the implementation of Chem 135 for Zoo & Wildlife Biology Majors in Spring 2017. 2) ETS scores were acceptable this year. The department has opted to not make any changes to the curriculum at this time.
Demonstrate an ability to analyze various kinds of experimental data used in the chemical disciplines including the output of various instrumental techniques (Departmental Outcome E).	1) Each student must obtain a minimum cumulative score of 15 on each of 5 instrumental assignments (i.e., IR/MS/NMR assignments) completed in Chem 322.	All students who passed the class met the minimum score of 15 on all 5 assignments.	Since 2012, a passing grade on each assignment has been officially required in order to pass the class. In Spring 2014, the instructor implemented a policy of assigning a grade of "Incomplete" until all students had met the minimum criteria. As a result, the number of deficient criteria has dropped dramatically. At the encouragement of the Chemistry Program's external reviewers, the departmental chemistry faculty have agreed to add an additional 4 instrumental assignments to the existing slate of 5. The chemistry faculty are hoping to implement these new assignments within the next one or two reporting cycles.
Demonstrate an understanding of the biological characteristics of each of the major kingdoms (Departmental Outcome F)	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Organismal Sub-score.	1) Average Organismal sub-score is 61.1 (+0.60σ). No individuals failed to meet the -1.5σ criterion.	In light of the successful scores of several recent cohorts on the organismal sub-section of the ETS, the department has opted to not make any programmatic changes at this time. Individuals missing the criterion of –1.5σ on other sub-sections or even as composite scores are a concern for us, but legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist. The department is more concerned when students who have acceptable GPAs routinely miss this threshold. This has occasionally happened, but not routinely. The department has slated this as an agenda item for a future departmental meeting.
Demonstrate an understanding of the fundamental concepts of molecular biology and genetics (Departmental Outcome G).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Molecular Biology and Genetics sub-scores.	1) Average Molecular Biology/Genetics sub-score is 58.8 (+0.45σ). Two individuals failed to meet the –1.50σ criterion.	The composite average score was well-above the national average this year. Although this is cause for celebration, individuals missing the criterion of –1.5σ are a concern for us. This has occasionally happened (two this year), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting.

Demonstrate an ability to properly relate biological structure and function (Departmental Outcome I).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Cell Biology sub-score.	1) Average Cell Biology sub-score is 53.9 (+0.07σ). A single individual failed to meet the –1.5σ criterion.	This sub-section of the ETS has historically been lowest. For this reason, a curricular change was proposed and passed by the full faculty that added one credit hour to the introductory Cell Biology course effective Fall 2012. It is still too early to tell if this curricular change will impact our scores on this section (i.e., Spring 2016 graduating class will be the first to take the ETS having benefited from this curricular change). Individuals missing the criterion of –1.5σ on other sub-sections or even as composite scores are a concern for us. This has occasionally happened (one this year on this sub-section), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Lastly, in last year's report, we indicated that we would like to add an additional instrument to assess this outcome -- a minimum score of 70% on the cell biology content of our in-house biology post-test. This has proved more difficult than at first anticipated and was not completed for this report. Since so many of our curricular/personnel changes should begin impacting the 2016 report data, we are holding off on the new assessment until then as well.
Demonstrate the capability of working with animals in safe and ethical ways that conform to state and national guidelines (Departmental Outcome J).	1) Minimum score of 35/60 on an Animal Care Portfolio with no single sub-score lower than 2.	1) All Animal Care Portfolio composite scores met the departmental criteria for success, while five individual element scores did not.	This instrument is still fairly new (this is the third year of good data collected with this instrument). Last year, the department began checking for completion of the Animal Care Portfolio during advising week of a student's junior spring; still, some students procrastinated on their portfolios and did not turn them in until their senior year. The department should be able to enforce this more effectively by opening up lines of communication with the registrar's office. If the department refuses to approve potential graduates or the registrar refuses to release diplomas until the portfolio meets the minimum standards, the desired portfolio quality seems obtainable. What is necessary is a point person within the department to address these concerns. Two or three such individuals are good candidates for this role, and these individuals have been involved in a discussion to address this issue.

Demonstrate the capability of analyzing and reporting empirical data from the biological sciences (Departmental Outcome K).	Instrument has been dropped in favor of a newer one that has yet to be developed.	NO DATA	Previous reports have indicated that our department has been having a long and rather continuous conversation about the need to implement a research methods course. This course was finally developed and approved by the department and full faculty. It is scheduled to run in Fall 2016 for the first time. The exact nature of the assessment instrument is still in flux, but the department has completed the most difficult step in addressing this shortfall. It will be possible to build an appropriate assessment instrument into the course as it runs in Fall 2016.
Demonstrate a balanced concept of molecular, micro, and macro levels of biological phenomena in the context of human systems (Departmental Outcome L).	1) Mean score no lower than 8/12 on the A&P questions of the in-house biology post-test. No individual with a score lower than 5/12. (Note: New instrument – criteria are still being evaluated).	1) NO DATA for this reporting period.	Although Biol 132 exam scores were retained for several years with the goal of extracting the scores of our graduates from the overwhelming number of nursing students who took the course, the retirement of our A&P instructor has caused us to change course. The current in-house biology pre-test / post-test exam has been altered to accommodate roughly 12 questions covering human A&P content. The performance of our biology pre-professional students on these 12 questions will be used to show improvement in human A&P content knowledge. The first administration of this altered exam was tentatively scheduled for Spring 2015, but did not occur until Fall 2016. Preliminary data will be included in the 2016 assessment report. The current A&P instructor is also researching an additional assessment that might allow for true comparisons with national averages.
Demonstrate the ability to properly relate biological structure and function in the context of human systems (Departmental Outcome M).	1) Mean score no lower than 8/12 on the A&P questions of the in-house biology post-test. No individual with a score lower than 5/12. (Note: New instrument – criteria are still being evaluated).	1) NO DATA for this reporting period.	See comments in table cell for Departmental PILO 'L'.

Demonstrate the level of content mastery required for potential successful performance in graduate school biology programs or professional schools (Departmental Outcome N).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam composite score. 2) Mean score no lower than 31/50 and no individual score lower than 24/50 on the departmental biology Post-Test	1) Average ETS composite score is 160.1 (+0.53σ). Lowest individual score is 132 (-1.64σ). 2) Mean score on in-house Biology post-test is 34.07. One individual failed to meet the minimum score of 24 (lowest score was 17).	1) As has been the case for several years, the average ETS composite score has been meeting the departmental standard. Occasionally, an individual student fails to meet the minimum score – this happened again this year. The score of 132 in this year's data marks the second lowest ETS composite score ever obtained by a Malone student. Although legitimate reasons for individual students missing the cutoff do exist (e.g., illness, test anxiety), the department has an intuition that it can do more. 2) The score of 17 in this year's data was achieved by the same student that achieved the 132 on the ETS exam. This student obtained a score of 17 on the pre-test as well, and the lack of change, at face value, indicates that this student did not absorb any content knowledge whatsoever. Results of this nature are most unsettling. Several options to address the occasional outlier are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Until the impact of the extra credit hour in Biol 144 and the impact of biology faculty personnel changes are manifested, it seems premature to us to alter the curriculum.

Program Name: Chemistry (Forensic Science Track)

Assessed by: Jeff Goff, Dept. of Natural Sciences

Date/Cycle of Assessment: Submitted on 10/31/2016
Reporting cycle of January 2015 – December 2015

Mission Statement:

The Malone University Department of Natural Sciences exists to engage students in the study of God's majesty and character by exploring His handiwork as it is revealed in Nature, both animate and inanimate; to promote the wise and thoughtful stewardship of the natural resources He has entrusted to us; and to encourage students to demonstrate God's love in their respective communities by using the knowledge and skills they acquire here.

Program Goals:

- Students should comprehend the central concepts of chemistry, the underlying assumptions of chemical knowledge, and be able to employ the methods of inquiry commonly utilized by practicing chemists at a level sufficient for entrance into graduate school, professional schools, and industry (Stems from Malone Educ. Goals A4, D1, and D3).
- Students should become proficient in solving chemical problems using both quantitative and qualitative approaches and in interpreting data generated by analytical instruments commonly employed by practicing chemists (Stems from Malone Educ. Goals C3, D4, and D5).
- Students should be able to apply the principles of Christian Stewardship to chemical practice and interpret chemical phenomena within a Christian worldview (Stems from Malone Educ. Goals D2, E1, and E5).

MALONE UNIVERSITY ANNUAL ASSESSMENT REPORT (See Appendix for Raw Data and Detailed Analysis)

Department: *Natural Sciences*
Program: *Chemistry (Forensic Science Track)*
Assessed by: *Jeffrey M. Goff - Dept. of Natural Sciences*
Time Period Covered: *January 2015-December 2015*
Submission Date: *10/31/2016*

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
Demonstrate the capability of integrating data and assessing phenomena within a Christian paradigm (Departmental Outcome A).	1) Average cumulative score ≥ 12; minimum cumulative score of 8; no individual component score of 1 on the Faith and Learning Assessment Instrument as scored by the associated rubric.	Average composite score = 14.41; minimum composite score = 8; # of individual component scores of 1 was 3.	Data here represent the sixth data set ever collected with this instrument. Average composite score and individual composite scores all met the departmental criteria for success. However, 3 individual component scores were not acceptable. Two of the low individual component scores were from a single individual's essays who, we believe, avoided the question due to the sensitivity of the material. As a result, the department reworded the instrument to be less offensive to students whose worldviews differ significantly from Malone's in order to elicit more on-task participation.
Demonstrate a comprehension of the central concepts of chemistry including the major theories and laws which govern chemical phenomena (Departmental Outcome B).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Gen Chem II Exam. 2) ACS Gen Chem II Exam score used as a Pre-Test for obtaining baseline data only (not used to assess success, but merely preparation for freshman chemistry sequence).	1) Mean score on the ACS Gen Chem Exam is 29.14 (-0.80σ). Ten individuals failed to meet the -1.5σ criterion. 2) Class average on ACS Gen Chem pre-test is 18.81 giving strong evidence of student improvement, but the scores of the freshman cohort as it exits is well below the national average (24^{th} percentile)	The 10 low ACS Gen Chem Exam scores and the low average score for the cohort are in keeping with other recent cohorts and are disappointing to the department. The extremely low CCDT results for Fall 2008 - Fall 2010 are evidence that our students enter well below the national average, so cohorts exiting below the national average do not necessarily imply a poor program. The ACS Gen Chem II pre-test scores, when compared to the post-test scores, are extremely strong evidence that our students are improving as a result of our freshman chemistry sequence. The department has concluded that our students enter below the national average and then exit below the national average in spite of the significant improvement in content knowledge. The department responded by developing a new, alternative Gen Chem II course for Zoo and Wildlife Biology Majors. Course is scheduled to run for the first time in Spring 2017.

Demonstrate an understanding of the relationships between structure and behavior of the chemical elements in their various forms and combinations (Departmental Outcome C).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chem Exam. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Inorganic Chem Exam. 3) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam Organic and Inorganic Sub-scores.	1) Mean score on the ACS Organic Chem Exam was 36.45 (–0.23σ). No individuals failed to meet the -1.5σ criterion. 2) Most recent mean score on the ACS Inorganic Chem Exam was 25.67 (–0.33σ). Only 1 individual failed to meet the –1.5σ criterion. 3) Average sub-scores on the Organic and Inorganic sections of the ETS chemistry exam are 61.0 and 56.7 respectively (+0.89σ and +0.56σ respectively). No individuals failed to meet the –1.5σ criterion on either sub-section).	1) This data set represents the fifth year in a row that ACS composite scores have met the departmental criteria for success. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. 2) Composite scores on the ACS Inorganic exam have met the minimum standard set by the department since 2009. The occasional individual still misses the –1.5σ criterion, however. The success of our students on the ETS inorganic sub-section, however, is comforting and leads us to believe that no programmatic changes are warranted at this time. 3) ETS scores were acceptable again this year. The department has opted to not make any changes to the curriculum at this time.
Demonstrate safe laboratory practices and an environmental ethic as it pertains to chemical use and disposal (Departmental Outcome D).	Minimum scores of 20, 21, and 20 must be obtained respectively on 3 safety projects completed as a component of our Chem 201 course (Stewardship and Safety in Chemical Practice) and graded via associated rubrics. In addition to the composite scores criteria on all 3 projects, minimum individual element scores have also been set.	Of 9 students, only 1 student failed to reach the minimum score of 20 on Safety Project #1 (1 individual element score missed criterion). On Safety Project #2, all students met the minimum composite score criterion of 21 and all individual element scores were satisfactory as well. On Safety Project #3, all students met the minimum composite score criterion of 20, though 1 individual element score missed the minimum standard.	1) Although two individual element scores were low and 1 student failed to meet a minimum composite score, the instructor feels strongly that this was due to a lack of time. The extensive one-on-one time required of the professor/student precluded these individuals from repeating a few of the assessments. Rather than fail the students, the instructor opted to allow the few sub-par scores with the intention of scheduling additional sessions at the next offering to give each student enough opportunities to meet the minimum scores on each project. The same problem was noted in last year's report, so the good intentions of the instructor may not be sufficient to accomplish the desired change. To step the efforts up a notch, the instructor has also incorporated feedback from the class in a proposal to the department that would add an additional credit hour to the class to assure that the assessments have adequate time for completion.

Demonstrate an ability to analyze various kinds of experimental data used in the chemical disciplines including the output of various instrumental techniques (Departmental Outcome E).	1) Each student must obtain a minimum cumulative score of 15 on each of 5 instrumental assignments (i.e., IR/MS/NMR assignments) completed in Chem 322.	All students who passed the class met the minimum score of 15 on all 5 assignments.	Since 2012, a passing grade on each assignment has been officially required in order to pass the class. In Spring 2014, the instructor implemented a policy of assigning a grade of "Incomplete" until all students had met the minimum criteria. As a result, the number of deficient criteria has dropped dramatically. At the encouragement of the Chemistry Program's external reviewers, the departmental chemistry faculty have agreed to add an additional 4 instrumental assignments to the existing slate of 5. The chemistry faculty are hoping to implement these new assignments within the next one or two reporting cycles.
Demonstrate the level of content mastery required for potential successful performance in chemical industry, graduate school chemistry programs, or professional schools (Departmental Outcome P).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam composite score. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chemistry exam.	1) Mean ETS composite score is 155.7. (+0.51σ). No individuals failed to meet the -1.5σ criterion. 2) Mean score on the ACS Organic Chem Exam was 36.45 (-0.23σ). No individuals failed to meet the -1.5σ criterion.	1) ETS Composite data have been acceptable for the last several years. 2) This data set represents the fifth year in a row that ACS scores have met the departmental criteria for success in organic. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. No changes appear to be warranted at this time.

Program Name: Chemistry (Graduate School Track)

Assessed by: Jeff Goff, Dept. of Natural Sciences

Date/Cycle of Assessment: Submitted on 10/31/2016
Reporting cycle of January 2015 – December 2015

Mission Statement:

The Malone University Department of Natural Sciences exists to engage students in the study of God's majesty and character by exploring His handiwork as it is revealed in Nature, both animate and inanimate; to promote the wise and thoughtful stewardship of the natural resources He has entrusted to us; and to encourage students to demonstrate God's love in their respective communities by using the knowledge and skills they acquire here.

Program Goals:

- Students should comprehend the central concepts of chemistry, the underlying assumptions of chemical knowledge, and be able to employ the methods of inquiry commonly utilized by practicing chemists at a level sufficient for entrance into graduate school, professional schools, and industry (Stems from Malone Educ. Goals A4, D1, and D3).
- Students should become proficient in solving chemical problems using both quantitative and qualitative approaches and in interpreting data generated by analytical instruments commonly employed by practicing chemists (Stems from Malone Educ. Goals C3, D4, and D5).
- Students should be able to apply the principles of Christian Stewardship to chemical practice and interpret chemical phenomena within a Christian worldview (Stems from Malone Educ. Goals D2, E1, and E5).

MALONE UNIVERSITY ANNUAL ASSESSMENT REPORT (See Appendix for Raw Data and Detailed Analysis)

Department: *Natural Sciences*
Program: *Chemistry (Graduate School Track)*
Assessed by: *Jeffrey M. Goff - Dept. of Natural Sciences*
Time Period Covered: *January 2015-December 2015*
Submission Date: *10/31/2016*

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
Demonstrate the capability of integrating data and assessing phenomena within a Christian paradigm (Departmental Outcome A).	1) Average cumulative score ≥ 12; minimum cumulative score of 8; no individual component score of 1 on the Faith and Learning Assessment Instrument as scored by the associated rubric.	Average composite score = 14.41; minimum composite score = 8; # of individual component scores of 1 was 3.	Data here represent the sixth data set ever collected with this instrument. Average composite score and individual composite scores all met the departmental criteria for success. However, 3 individual component scores were not acceptable. Two of the low individual component scores were from a single individual's essays who, we believe, avoided the question due to the sensitivity of the material. As a result, the department reworded the instrument to be less offensive to students whose worldviews differ significantly from Malone's in order to elicit more on-task participation.
Demonstrate a comprehension of the central concepts of chemistry including the major theories and laws which govern chemical phenomena (Departmental Outcome B).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Gen Chem II Exam. 2) ACS Gen Chem II Exam score used as a Pre-Test for obtaining baseline data only (not used to assess success, but merely preparation for freshman chemistry sequence).	1) Mean score on the ACS Gen Chem Exam is 29.14 (-0.80σ). Ten individuals failed to meet the -1.5σ criterion. 2) Class average on ACS Gen Chem pre-test is 18.81 giving strong evidence of student improvement, but the scores of the freshman cohort as it exits is well below the national average (24^{th} percentile)	The 10 low ACS Gen Chem Exam scores and the low average score for the cohort are in keeping with other recent cohorts and are disappointing to the department. The extremely low CCDT results for Fall 2008 - Fall 2010 are evidence that our students enter well below the national average, so cohorts exiting below the national average do not necessarily imply a poor program. The ACS Gen Chem II pre-test scores, when compared to the post-test scores, are extremely strong evidence that our students are improving as a result of our freshman chemistry sequence. The department has concluded that our students enter below the national average and then exit below the national average in spite of the significant improvement in content knowledge. The department responded by developing a new, alternative Gen Chem II course for Zoo and Wildlife Biology Majors. Course is scheduled to run for the first time in Spring 2017.

Demonstrate an understanding of the relationships between structure and behavior of the chemical elements in their various forms and combinations (Departmental Outcome C).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chem Exam. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Inorganic Chem Exam. 3) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam Organic and Inorganic Sub-scores.	1) Mean score on the ACS Organic Chem Exam was 36.45 (–0.23σ). No individuals failed to meet the -1.5σ criterion. 2) Most recent mean score on the ACS Inorganic Chem Exam was 25.67 (–0.33σ). Only 1 individual failed to meet the –1.5σ criterion. 3) Average sub-scores on the Organic and Inorganic sections of the ETS chemistry exam are 61.0 and 56.7 respectively (+0.89σ and +0.56σ respectively). No individuals failed to meet the –1.5σ criterion on either sub-section).	1) This data set represents the fifth year in a row that ACS composite scores have met the departmental criteria for success. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. 2) Composite scores on the ACS Inorganic exam have met the minimum standard set by the department since 2009. The occasional individual still misses the –1.5σ criterion, however. The success of our students on the ETS inorganic sub-section, however, is comforting and leads us to believe that no programmatic changes are warranted at this time. 3) ETS scores were acceptable again this year. The department has opted to not make any changes to the curriculum at this time.
Demonstrate safe laboratory practices and an environmental ethic as it pertains to chemical use and disposal (Departmental Outcome D).	Minimum scores of 20, 21, and 20 must be obtained respectively on 3 safety projects completed as a component of our Chem 201 course (Stewardship and Safety in Chemical Practice) and graded via associated rubrics. In addition to the composite scores criteria on all 3 projects, minimum individual element scores have also been set.	Of 9 students, only 1 student failed to reach the minimum score of 20 on Safety Project #1 (1 individual element score missed criterion). On Safety Project #2, all students met the minimum composite score criterion of 21 and all individual element scores were satisfactory as well. On Safety Project #3, all students met the minimum composite score criterion of 20, though 1 individual element score missed the minimum standard.	1) Although two individual element scores were low and 1 student failed to meet a minimum composite score, the instructor feels strongly that this was due to a lack of time. The extensive one-on-one time required of the professor/student precluded these individuals from repeating a few of the assessments. Rather than fail the students, the instructor opted to allow the few sub-par scores with the intention of scheduling additional sessions at the next offering to give each student enough opportunities to meet the minimum scores on each project. The same problem was noted in last year's report, so the good intentions of the instructor may not be sufficient to accomplish the desired change. To step the efforts up a notch, the instructor has also incorporated feedback from the class in a proposal to the department that would add an additional credit hour to the class to assure that the assessments have adequate time for completion.

Demonstrate an ability to analyze various kinds of experimental data used in the chemical disciplines including the output of various instrumental techniques (Departmental Outcome E).	1) Each student must obtain a minimum cumulative score of 15 on each of 5 instrumental assignments (i.e., IR/MS/NMR assignments) completed in Chem 322.	All students who passed the class met the minimum score of 15 on all 5 assignments.	Since 2012, a passing grade on each assignment has been officially required in order to pass the class. In Spring 2014, the instructor implemented a policy of assigning a grade of "Incomplete" until all students had met the minimum criteria. As a result, the number of deficient criteria has dropped dramatically. At the encouragement of the Chemistry Program's external reviewers, the departmental chemistry faculty have agreed to add an additional 4 instrumental assignments to the existing slate of 5. The chemistry faculty are hoping to implement these new assignments within the next one or two reporting cycles.
Demonstrate the level of content mastery required for potential successful performance in chemical industry, graduate school chemistry programs, or professional schools (Departmental Outcome P).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam composite score. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chemistry exam.	1) Mean ETS composite score is 155.7. (+0.51σ). No individuals failed to meet the -1.5σ criterion. 2) Mean score on the ACS Organic Chem Exam was 36.45 (-0.23σ). No individuals failed to meet the -1.5σ criterion.	1) ETS Composite data have been acceptable for the last several years. 2) This data set represents the fifth year in a row that ACS scores have met the departmental criteria for success in organic. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. No changes appear to be warranted at this time.

Program Name: Chemistry (Pre-Dentistry Track)

Assessed by: Jeff Goff, Dept. of Natural Sciences

Date/Cycle of Assessment: Submitted on 10/31/2016;
Reporting cycle of January 2015 – December 2015

Mission Statement:

The Malone University Department of Natural Sciences exists to engage students in the study of God's majesty and character by exploring His handiwork as it is revealed in Nature, both animate and inanimate; to promote the wise and thoughtful stewardship of the natural resources He has entrusted to us; and to encourage students to demonstrate God's love in their respective communities by using the knowledge and skills they acquire here.

Program Goals:

- Students should comprehend the central concepts of chemistry, the underlying assumptions of chemical knowledge, and be able to employ the methods of inquiry commonly utilized by practicing chemists at a level sufficient for entrance into graduate school, professional schools, and industry (Stems from Malone Educ. Goals A4, D1, and D3).
- Students should become proficient in solving chemical problems using both quantitative and qualitative approaches and in interpreting data generated by analytical instruments commonly employed by practicing chemists (Stems from Malone Educ. Goals C3, D4, and D5).
- Students should be able to apply the principles of Christian Stewardship to chemical practice and interpret chemical phenomena within a Christian worldview (Stems from Malone Educ. Goals D2, E1, and E5).

MALONE UNIVERSITY ANNUAL ASSESSMENT REPORT (See Appendix for Raw Data and Detailed Analysis)

Department: *Natural Sciences*
Program: *Chemistry (Pre-Dentistry Track)*
Assessed by: *Jeffrey M. Goff - Dept. of Natural Sciences*
Time Period Covered: *January 2015-December 2015*
Submission Date: *10/31/2016*

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
Demonstrate the capability of integrating data and assessing phenomena within a Christian paradigm (Departmental Outcome A).	1) Average cumulative score ≥ 12; minimum cumulative score of 8; no individual component score of 1 on the Faith and Learning Assessment Instrument as scored by the associated rubric.	Average composite score = 14.41; minimum composite score = 8; # of individual component scores of 1 was 3.	Data here represent the sixth data set ever collected with this instrument. Average composite score and individual composite scores all met the departmental criteria for success. However, 3 individual component scores were not acceptable. Two of the low individual component scores were from a single individual's essays who, we believe, avoided the question due to the sensitivity of the material. As a result, the department reworded the instrument to be less offensive to students whose worldviews differ significantly from Malone's in order to elicit more on-task participation.
Demonstrate a comprehension of the central concepts of chemistry including the major theories and laws which govern chemical phenomena (Departmental Outcome B).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Gen Chem II Exam. 2) ACS Gen Chem II Exam score used as a Pre-Test for obtaining baseline data only (not used to assess success, but merely preparation for freshman chemistry sequence).	1) Mean score on the ACS Gen Chem Exam is 29.14 (-0.80σ). Ten individuals failed to meet the -1.5σ criterion. 2) Class average on ACS Gen Chem pre-test is 18.81 giving strong evidence of student improvement, but the scores of the freshman cohort as it exits is well below the national average (24^{th} percentile)	The 10 low ACS Gen Chem Exam scores and the low average score for the cohort are in keeping with other recent cohorts and are disappointing to the department. The extremely low CCDT results for Fall 2008 - Fall 2010 are evidence that our students enter well below the national average, so cohorts exiting below the national average do not necessarily imply a poor program. The ACS Gen Chem II pre-test scores, when compared to the post-test scores, are extremely strong evidence that our students are improving as a result of our freshman chemistry sequence. The department has concluded that our students enter below the national average and then exit below the national average in spite of the significant improvement in content knowledge. The department responded by developing a new, alternative Gen Chem II course for Zoo and Wildlife Biology Majors. Course is scheduled to run for the first time in Spring 2017.

Demonstrate an understanding of the relationships between structure and behavior of the chemical elements in their various forms and combinations (Departmental Outcome C).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chem Exam. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Inorganic Chem Exam. 3) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam Organic and Inorganic Sub-scores.	1) Mean score on the ACS Organic Chem Exam was 36.45 (–0.23σ). No individuals failed to meet the -1.5σ criterion. 2) Most recent mean score on the ACS Inorganic Chem Exam was 25.67 (–0.33σ). Only 1 individual failed to meet the –1.5σ criterion. 3) Average sub-scores on the Organic and Inorganic sections of the ETS chemistry exam are 61.0 and 56.7 respectively (+0.89σ and +0.56σ respectively). No individuals failed to meet the –1.5σ criterion on either sub-section).	1) This data set represents the fifth year in a row that ACS composite scores have met the departmental criteria for success. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. 2) Composite scores on the ACS Inorganic exam have met the minimum standard set by the department since 2009. The occasional individual still misses the –1.5σ criterion, however. The success of our students on the ETS inorganic sub-section, however, is comforting and leads us to believe that no programmatic changes are warranted at this time. 3) ETS scores were acceptable again this year. The department has opted to not make any changes to the curriculum at this time.
Demonstrate safe laboratory practices and an environmental ethic as it pertains to chemical use and disposal (Departmental Outcome D).	Minimum scores of 20, 21, and 20 must be obtained respectively on 3 safety projects completed as a component of our Chem 201 course (Stewardship and Safety in Chemical Practice) and graded via associated rubrics. In addition to the composite scores criteria on all 3 projects, minimum individual element scores have also been set.	Of 9 students, only 1 student failed to reach the minimum score of 20 on Safety Project #1 (1 individual element score missed criterion). On Safety Project #2, all students met the minimum composite score criterion of 21 and all individual element scores were satisfactory as well. On Safety Project #3, all students met the minimum composite score criterion of 20, though 1 individual element score missed the minimum standard.	1) Although two individual element scores were low and 1 student failed to meet a minimum composite score, the instructor feels strongly that this was due to a lack of time. The extensive one-on-one time required of the professor/student precluded these individuals from repeating a few of the assessments. Rather than fail the students, the instructor opted to allow the few sub-par scores with the intention of scheduling additional sessions at the next offering to give each student enough opportunities to meet the minimum scores on each project. The same problem was noted in last year's report, so the good intentions of the instructor may not be sufficient to accomplish the desired change. To step the efforts up a notch, the instructor has also incorporated feedback from the class in a proposal to the department that would add an additional credit hour to the class to assure that the assessments have adequate time for completion.

Demonstrate an ability to analyze various kinds of experimental data used in the chemical disciplines including the output of various instrumental techniques (Departmental Outcome E).	1) Each student must obtain a minimum cumulative score of 15 on each of 5 instrumental assignments (i.e., IR/MS/NMR assignments) completed in Chem 322.	All students who passed the class met the minimum score of 15 on all 5 assignments.	Since 2012, a passing grade on each assignment has been officially required in order to pass the class. In Spring 2014, the instructor implemented a policy of assigning a grade of "Incomplete" until all students had met the minimum criteria. As a result, the number of deficient criteria has dropped dramatically. At the encouragement of the Chemistry Program's external reviewers, the departmental chemistry faculty have agreed to add an additional 4 instrumental assignments to the existing slate of 5. The chemistry faculty are hoping to implement these new assignments within the next one or two reporting cycles.
Demonstrate a balanced concept of molecular, micro, and macro levels of biological phenomena in the context of human systems (Departmental Outcome L).	1) Mean score no lower than 8/12 on the A&P questions of the in-house biology post-test. No individual with a score lower than 5/12. (Note: New instrument – criteria are still being evaluated).	1) NO DATA for this reporting period.	Although Biol 132 exam scores were retained for several years with the goal of extracting the scores of our graduates from the overwhelming number of nursing students who took the course, the retirement of our A&P instructor has caused us to change course. The current in-house biology pre-test / post-test exam has been altered to accommodate roughly 12 questions covering human A&P content. The performance of our biology pre-professional students on these 12 questions will be used to show improvement in human A&P content knowledge. The first administration of this altered exam was tentatively scheduled for Spring 2015, but did not occur until Fall 2016. Preliminary data will be included in the 2016 assessment report. The current A&P instructor is also researching an additional assessment that might allow for true comparisons with national averages.
Demonstrate the ability to properly relate biological structure and function in the context of human systems (Departmental Outcome M).	1) Mean score no lower than 8/12 on the A&P questions of the in-house biology post-test. No individual with a score lower than 5/12. (Note: New instrument – criteria are still being evaluated).	1) NO DATA for this reporting period.	See comments in table cell for Departmental PILO 'L'.

Demonstrate the level of content mastery required for potential successful performance in chemical industry, graduate school chemistry programs, or professional schools (Departmental Outcome P).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam composite score. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chemistry exam.	1) Mean ETS composite score is 155.7. (+0.51σ). No individuals failed to meet the -1.5σ criterion. 2) Mean score on the ACS Organic Chem Exam was 36.45 (–0.23σ). No individuals failed to meet the -1.5σ criterion.	1) ETS Composite data have been acceptable for the last several years. 2) This data set represents the fifth year in a row that ACS scores have met the departmental criteria for success in organic. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. No changes appear to be warranted at this time.

Program Name: Chemistry (Pre-Medicine Track)

Assessed by: Jeff Goff, Dept. of Natural Sciences

Date/Cycle of Assessment: Submitted on 10/31/2016;
Reporting cycle of January 2015 – December 2015

Mission Statement:

The Malone University Department of Natural Sciences exists to engage students in the study of God's majesty and character by exploring His handiwork as it is revealed in Nature, both animate and inanimate; to promote the wise and thoughtful stewardship of the natural resources He has entrusted to us; and to encourage students to demonstrate God's love in their respective communities by using the knowledge and skills they acquire here.

Program Goals:

- Students should comprehend the central concepts of chemistry, the underlying assumptions of chemical knowledge, and be able to employ the methods of inquiry commonly utilized by practicing chemists at a level sufficient for entrance into graduate school, professional schools, and industry (Stems from Malone Educ. Goals A4, D1, and D3).
- Students should become proficient in solving chemical problems using both quantitative and qualitative approaches and in interpreting data generated by analytical instruments commonly employed by practicing chemists (Stems from Malone Educ. Goals C3, D4, and D5).
- Students should be able to apply the principles of Christian Stewardship to chemical practice and interpret chemical phenomena within a Christian worldview (Stems from Malone Educ. Goals D2, E1, and E5).

MALONE UNIVERSITY ANNUAL ASSESSMENT REPORT (See Appendix for Raw Data and Detailed Analysis)

Department: *Natural Sciences*
Program: *Chemistry (Pre-Medicine Track)*
Assessed by: *Jeffrey M. Goff - Chair, Dept. of Natural Sciences*
Time Period Covered: *January 2015-December 2015*
Submission Date: *10/31/2016*

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
Demonstrate the capability of integrating data and assessing phenomena within a Christian paradigm (Departmental Outcome A).	1) Average cumulative score ≥ 12; minimum cumulative score of 8; no individual component score of 1 on the Faith and Learning Assessment Instrument as scored by the associated rubric.	Average composite score = 14.41; minimum composite score = 8; # of individual component scores of 1 was 3.	Data here represent the sixth data set ever collected with this instrument. Average composite score and individual composite scores all met the departmental criteria for success. However, 3 individual component scores were not acceptable. Two of the low individual component scores were from a single individual's essays who, we believe, avoided the question due to the sensitivity of the material. As a result, the department reworded the instrument to be less offensive to students whose worldviews differ significantly from Malone's in order to elicit more on-task participation.
Demonstrate a comprehension of the central concepts of chemistry including the major theories and laws which govern chemical phenomena (Departmental Outcome B).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Gen Chem II Exam. 2) ACS Gen Chem II Exam score used as a Pre-Test for obtaining baseline data only (not used to assess success, but merely preparation for freshman chemistry sequence).	1) Mean score on the ACS Gen Chem Exam is 29.14 (-0.80σ). Ten individuals failed to meet the -1.5σ criterion. 2) Class average on ACS Gen Chem pre-test is 18.81 giving strong evidence of student improvement, but the scores of the freshman cohort as it exits is well below the national average (24^{th} percentile)	The 10 low ACS Gen Chem Exam scores and the low average score for the cohort are in keeping with other recent cohorts and are disappointing to the department. The extremely low CCDT results for Fall 2008 - Fall 2010 are evidence that our students enter well below the national average, so cohorts exiting below the national average do not necessarily imply a poor program. The ACS Gen Chem II pre-test scores, when compared to the post-test scores, are extremely strong evidence that our students are improving as a result of our freshman chemistry sequence. The department has concluded that our students enter below the national average and then exit below the national average in spite of the significant improvement in content knowledge. The department responded by developing a new, alternative Gen Chem II course for Zoo and Wildlife Biology Majors. Course is scheduled to run for the first time in Spring 2017.

Demonstrate an understanding of the relationships between structure and behavior of the chemical elements in their various forms and combinations (Departmental Outcome C).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chem Exam. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Inorganic Chem Exam. 3) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam Organic and Inorganic Sub-scores.	1) Mean score on the ACS Organic Chem Exam was 36.45 (–0.23σ). No individuals failed to meet the -1.5σ criterion. 2) Most recent mean score on the ACS Inorganic Chem Exam was 25.67 (–0.33σ). Only 1 individual failed to meet the –1.5σ criterion. 3) Average sub-scores on the Organic and Inorganic sections of the ETS chemistry exam are 61.0 and 56.7 respectively (+0.89σ and +0.56σ respectively). No individuals failed to meet the –1.5σ criterion on either sub-section).	1) This data set represents the fifth year in a row that ACS composite scores have met the departmental criteria for success. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. 2) Composite scores on the ACS Inorganic exam have met the minimum standard set by the department since 2009. The occasional individual still misses the –1.5σ criterion, however. The success of our students on the ETS inorganic sub-section, however, is comforting and leads us to believe that no programmatic changes are warranted at this time. 3) ETS scores were acceptable again this year. The department has opted to not make any changes to the curriculum at this time.
Demonstrate safe laboratory practices and an environmental ethic as it pertains to chemical use and disposal (Departmental Outcome D).	Minimum scores of 20, 21, and 20 must be obtained respectively on 3 safety projects completed as a component of our Chem 201 course (Stewardship and Safety in Chemical Practice) and graded via associated rubrics. In addition to the composite scores criteria on all 3 projects, minimum individual element scores have also been set.	Of 9 students, only 1 student failed to reach the minimum score of 20 on Safety Project #1 (1 individual element score missed criterion). On Safety Project #2, all students met the minimum composite score criterion of 21 and all individual element scores were satisfactory as well. On Safety Project #3, all students met the minimum composite score criterion of 20, though 1 individual element score missed the minimum standard.	1) Although two individual element scores were low and 1 student failed to meet a minimum composite score, the instructor feels strongly that this was due to a lack of time. The extensive one-on-one time required of the professor/student precluded these individuals from repeating a few of the assessments. Rather than fail the students, the instructor opted to allow the few sub-par scores with the intention of scheduling additional sessions at the next offering to give each student enough opportunities to meet the minimum scores on each project. The same problem was noted in last year's report, so the good intentions of the instructor may not be sufficient to accomplish the desired change. To step the efforts up a notch, the instructor has also incorporated feedback from the class in a proposal to the department that would add an additional credit hour to the class to assure that the assessments have adequate time for completion.

Demonstrate an ability to analyze various kinds of experimental data used in the chemical disciplines including the output of various instrumental techniques (Departmental Outcome E).	1) Each student must obtain a minimum cumulative score of 15 on each of 5 instrumental assignments (i.e., IR/MS/NMR assignments) completed in Chem 322.	All students who passed the class met the minimum score of 15 on all 5 assignments.	Since 2012, a passing grade on each assignment has been officially required in order to pass the class. In Spring 2014, the instructor implemented a policy of assigning a grade of "Incomplete" until all students had met the minimum criteria. As a result, the number of deficient criteria has dropped dramatically. At the encouragement of the Chemistry Program's external reviewers, the departmental chemistry faculty have agreed to add an additional 4 instrumental assignments to the existing slate of 5. The chemistry faculty are hoping to implement these new assignments within the next one or two reporting cycles.
Demonstrate an understanding of the fundamental concepts of molecular biology and genetics (Departmental Outcome G).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Molecular Biology and Genetics sub-scores.	1) Average Molecular Biology/Genetics sub-score is 58.8 (+0.45σ). Two individuals failed to meet the –1.50σ criterion.	The composite average score was well-above the national average this year. Although this is cause for celebration, individuals missing the criterion of –1.5σ are a concern for us. This has occasionally happened (two this year), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting.
Demonstrate the level of content mastery required for potential successful performance in chemical industry, graduate school chemistry programs, or professional schools (Departmental Outcome P).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam composite score. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chemistry exam.	1) Mean ETS composite score is 155.7. (+0.51σ). No individuals failed to meet the -1.5σ criterion. 2) Mean score on the ACS Organic Chem Exam was 36.45 (–0.23σ). No individuals failed to meet the -1.5σ criterion.	1) ETS Composite data have been acceptable for the last several years. 2) This data set represents the fifth year in a row that ACS scores have met the departmental criteria for success in organic. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. No changes appear to be warranted at this time.

Program Name: Chemistry (Pre-Pharmacy Track)

Assessed by: Jeff Goff, Dept. of Natural Sciences

Date/Cycle of Assessment: Submitted on 10/31/2016;
Reporting cycle of January 2015 – December 2015

Mission Statement:

The Malone University Department of Natural Sciences exists to engage students in the study of God's majesty and character by exploring His handiwork as it is revealed in Nature, both animate and inanimate; to promote the wise and thoughtful stewardship of the natural resources He has entrusted to us; and to encourage students to demonstrate God's love in their respective communities by using the knowledge and skills they acquire here.

Program Goals:

- Students should comprehend the central concepts of chemistry, the underlying assumptions of chemical knowledge, and be able to employ the methods of inquiry commonly utilized by practicing chemists at a level sufficient for entrance into graduate school, professional schools, and industry (Stems from Malone Educ. Goals A4, D1, and D3).
- Students should become proficient in solving chemical problems using both quantitative and qualitative approaches and in interpreting data generated by analytical instruments commonly employed by practicing chemists (Stems from Malone Educ. Goals C3, D4, and D5).
- Students should be able to apply the principles of Christian Stewardship to chemical practice and interpret chemical phenomena within a Christian worldview (Stems from Malone Educ. Goals D2, E1, and E5).

MALONE UNIVERSITY ANNUAL ASSESSMENT REPORT (See Appendix for Raw Data and Detailed Analysis)

Department: *Natural Sciences*
Program: *Chemistry (Pre-Pharmacy Track)*
Assessed by: *Jeffrey M. Goff - Dept. of Natural Sciences*
Time Period Covered: *January 2015-December 2015*
Submission Date: *10/31/2016*

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
Demonstrate the capability of integrating data and assessing phenomena within a Christian paradigm (Departmental Outcome A).	1) Average cumulative score ≥ 12; minimum cumulative score of 8; no individual component score of 1 on the Faith and Learning Assessment Instrument as scored by the associated rubric.	Average composite score = 14.41; minimum composite score = 8; # of individual component scores of 1 was 3.	Data here represent the sixth data set ever collected with this instrument. Average composite score and individual composite scores all met the departmental criteria for success. However, 3 individual component scores were not acceptable. Two of the low individual component scores were from a single individual's essays who, we believe, avoided the question due to the sensitivity of the material. As a result, the department reworded the instrument to be less offensive to students whose worldviews differ significantly from Malone's in order to elicit more on-task participation.
Demonstrate a comprehension of the central concepts of chemistry including the major theories and laws which govern chemical phenomena (Departmental Outcome B).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Gen Chem II Exam. 2) ACS Gen Chem II Exam score used as a Pre-Test for obtaining baseline data only (not used to assess success, but merely preparation for freshman chemistry sequence).	1) Mean score on the ACS Gen Chem Exam is 29.14 (-0.80σ). Ten individuals failed to meet the -1.5σ criterion. 2) Class average on ACS Gen Chem pre-test is 18.81 giving strong evidence of student improvement, but the scores of the freshman cohort as it exits is well below the national average (24^{th} percentile)	The 10 low ACS Gen Chem Exam scores and the low average score for the cohort are in keeping with other recent cohorts and are disappointing to the department. The extremely low CCDT results for Fall 2008 - Fall 2010 are evidence that our students enter well below the national average, so cohorts exiting below the national average do not necessarily imply a poor program. The ACS Gen Chem II pre-test scores, when compared to the post-test scores, are extremely strong evidence that our students are improving as a result of our freshman chemistry sequence. The department has concluded that our students enter below the national average and then exit below the national average in spite of the significant improvement in content knowledge. The department responded by developing a new, alternative Gen Chem II course for Zoo and Wildlife Biology Majors. Course is scheduled to run for the first time in Spring 2017.

Demonstrate an understanding of the relationships between structure and behavior of the chemical elements in their various forms and combinations (Departmental Outcome C).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chem Exam. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Inorganic Chem Exam. 3) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam Organic and Inorganic Sub-scores.	1) Mean score on the ACS Organic Chem Exam was 36.45 (–0.23σ). No individuals failed to meet the -1.5σ criterion. 2) Most recent mean score on the ACS Inorganic Chem Exam was 25.67 (–0.33σ). Only 1 individual failed to meet the –1.5σ criterion. 3) Average sub-scores on the Organic and Inorganic sections of the ETS chemistry exam are 61.0 and 56.7 respectively (+0.89σ and +0.56σ respectively). No individuals failed to meet the –1.5σ criterion on either sub-section).	1) This data set represents the fifth year in a row that ACS composite scores have met the departmental criteria for success. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. 2) Composite scores on the ACS Inorganic exam have met the minimum standard set by the department since 2009. The occasional individual still misses the –1.5σ criterion, however. The success of our students on the ETS inorganic sub-section, however, is comforting and leads us to believe that no programmatic changes are warranted at this time. 3) ETS scores were acceptable again this year. The department has opted to not make any changes to the curriculum at this time.
Demonstrate safe laboratory practices and an environmental ethic as it pertains to chemical use and disposal (Departmental Outcome D).	Minimum scores of 20, 21, and 20 must be obtained respectively on 3 safety projects completed as a component of our Chem 201 course (Stewardship and Safety in Chemical Practice) and graded via associated rubrics. In addition to the composite scores criteria on all 3 projects, minimum individual element scores have also been set.	Of 9 students, only 1 student failed to reach the minimum score of 20 on Safety Project #1 (1 individual element score missed criterion). On Safety Project #2, all students met the minimum composite score criterion of 21 and all individual element scores were satisfactory as well. On Safety Project #3, all students met the minimum composite score criterion of 20, though 1 individual element score missed the minimum standard.	1) Although two individual element scores were low and 1 student failed to meet a minimum composite score, the instructor feels strongly that this was due to a lack of time. The extensive one-on-one time required of the professor/student precluded these individuals from repeating a few of the assessments. Rather than fail the students, the instructor opted to allow the few sub-par scores with the intention of scheduling additional sessions at the next offering to give each student enough opportunities to meet the minimum scores on each project. The same problem was noted in last year's report, so the good intentions of the instructor may not be sufficient to accomplish the desired change. To step the efforts up a notch, the instructor has also incorporated feedback from the class in a proposal to the department that would add an additional credit hour to the class to assure that the assessments have adequate time for completion.

Demonstrate an ability to analyze various kinds of experimental data used in the chemical disciplines including the output of various instrumental techniques (Departmental Outcome E).	1) Each student must obtain a minimum cumulative score of 15 on each of 5 instrumental assignments (i.e., IR/MS/NMR assignments) completed in Chem 322.	All students who passed the class met the minimum score of 15 on all 5 assignments.	Since 2012, a passing grade on each assignment has been officially required in order to pass the class. In Spring 2014, the instructor implemented a policy of assigning a grade of "Incomplete" until all students had met the minimum criteria. As a result, the number of deficient criteria has dropped dramatically. At the encouragement of the Chemistry Program's external reviewers, the departmental chemistry faculty have agreed to add an additional 4 instrumental assignments to the existing slate of 5. The chemistry faculty are hoping to implement these new assignments within the next one or two reporting cycles.
Demonstrate a balanced concept of molecular, micro, and macro levels of biological phenomena in the context of human systems (Departmental Outcome L).	1) Mean score no lower than 8/12 on the A&P questions of the in-house biology post-test. No individual with a score lower than 5/12. (Note: New instrument – criteria are still being evaluated).	1) NO DATA for this reporting period.	Although Biol 132 exam scores were retained for several years with the goal of extracting the scores of our graduates from the overwhelming number of nursing students who took the course, the retirement of our A&P instructor has caused us to change course. The current in-house biology pre-test / post-test exam has been altered to accommodate roughly 12 questions covering human A&P content. The performance of our biology pre-professional students on these 12 questions will be used to show improvement in human A&P content knowledge. The first administration of this altered exam was tentatively scheduled for Spring 2015, but did not occur until Fall 2016. Preliminary data will be included in the 2016 assessment report. The current A&P instructor is also researching an additional assessment that might allow for true comparisons with national averages.
Demonstrate the ability to properly relate biological structure and function in the context of human systems (Departmental Outcome M).	1) Mean score no lower than 8/12 on the A&P questions of the in-house biology post-test. No individual with a score lower than 5/12. (Note: New instrument – criteria are still being evaluated).	1) NO DATA for this reporting period.	See comments in table cell for Departmental PILO 'L'.

Demonstrate the level of content mastery required for potential successful performance in chemical industry, graduate school chemistry programs, or professional schools (Departmental Outcome P).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam composite score. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chemistry exam.	1) Mean ETS composite score is 155.7. (+0.51σ). No individuals failed to meet the -1.5σ criterion. 2) Mean score on the ACS Organic Chem Exam was 36.45 (–0.23σ). No individuals failed to meet the -1.5σ criterion.	1) ETS Composite data have been acceptable for the last several years. 2) This data set represents the fifth year in a row that ACS scores have met the departmental criteria for success in organic. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. No changes appear to be warranted at this time.

Program Name: Exercise Science

Assessed by: Steve Wirick

Date/Cycle of Assessment: Submitted on 10/31/2016;
Reporting cycle of August 2015 – July 2016

Mission Statement:

The Malone University Department of Science and Mathematics exists to engage students in the study of God's majesty and character by exploring His handiwork as it is revealed in Nature, both animate and inanimate; to promote the wise and thoughtful stewardship of the natural resources He has entrusted to us; and to encourage students to demonstrate God's love in their respective communities by using the knowledge and skills they acquire here.

Program Goals:

- Understand the physiological and behavioral foundations of physical activity, health and fitness.
- Explain the impact of physical activity, exercise, and sport on the health of individuals, groups, and communities.
- Promote basic and applied research on health, disease prevention, human behavior, and human performance.
- Assess the educational and fitness needs of individuals, groups and communities to promote health and human performance.
- Implement strategies to help individuals, groups, and communities to maintain and enhance physical performance, fitness, health, and quality of life.
- Study the structural, functional and behavioral phenomena related to health and exercise behavior in sport, clinical, and community settings.

MALONE UNIVERSITY ANNUAL ASSESSMENT REPORT

Department: *Science and Mathematics*
Program: *Exercise Science*
Assessed by: *Steve Wirick*
Time Period Covered: *August 2015 – July 2016*
Submission Date: *3/18/2016*

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
Demonstrate understanding of anatomical, kinesiological, and physiological concepts of exercise science	Direct: -Pre-test in PE 265 -Post-test in EXSC 435 -Criteria: 80% on post-test Indirect: -Senior exit survey -Criteria: 80%	 -N=11, Mean = 56.2, 48.87% -N=11, Mean = 93.4, 81.22% N=11, Mean = 4.25, 85%	Our students are consistently reaching the benchmark of 80% on the post-test which is correlating well to their success in passing certification exams in the exercise science field. Students generally feel well equipped to pursue careers in the exercise science profession
Demonstrate knowledge of the prevention, care, treatment, and rehabilitation of injuries	Direct: -Pre-test in PE 265 -Post-test in EXSC 435 -Criteria: 80% on post-test Indirect: -Senior exit survey -Criteria: 80%	 -N=11, Mean = 56.2, 48.87% -N=11, Mean = 93.4, 81.22% N=11, Mean = 4.25, 85%	Our students are consistently reaching the benchmark of 80% on the post-test which is correlating well to their success in passing certification exams in the exercise science field. Students generally feel well equipped to pursue careers in the exercise science profession
Demonstrate ability to assess fitness needs of individuals and groups	Indirect: -Internship evaluation -Criteria: 80%	N=11, Mean = 3.82, 95.5%	Our students continue to receive exceptional evaluations from their supervisors at the internship sites. We continue to develop strong relationships with area hospitals, private PT practices, fitness centers, and corporate facilities.
Demonstrate ability to plan effective exercise prescriptions for various populations	Indirect: -Internship evaluation -Criteria: 80%	N=11, Mean = 3.82, 95.5%	Our students continue to receive exceptional evaluations from their supervisors at the internship sites. We continue to develop strong relationships with area hospitals, private PT practices, fitness centers, and corporate facilities.

The revised curriculum for Exercise Science that was referenced during last year's assessment report is under its final modifications and we are anticipating it being presented to the full faculty for review later this semester. We are confident these curricular changes will establish Malone as the distinct University in the region that prepares our students exceptionally well for the Medical Fitness industry.

Program Name: Life Science Education

Assessed by: Jeff Goff, Dept. of Natural Sciences

Date/Cycle of Assessment: Submitted on 10/31/2016;
Reporting cycle of January 2015 – December 2015

Mission Statement:

The Malone University Department of Natural Sciences exists to engage students in the study of God's majesty and character by exploring His handiwork as it is revealed in Nature, both animate and inanimate; to promote the wise and thoughtful stewardship of the natural resources He has entrusted to us; and to encourage students to demonstrate God's love in their respective communities by using the knowledge and skills they acquire here.

Program Goals:

- Students should comprehend the central concepts of biology and chemistry, the underlying assumptions of biological knowledge and chemical knowledge, and be able to employ the methods of inquiry commonly utilized by practicing biologists and chemists at a level sufficient for competent teaching at the high school level (Stems from Malone Educ. Goals A4, D1, and D3).
- Students should become proficient in solving biological and chemical problems using both quantitative and qualitative approaches and in analyzing / interpreting data generated by experimental protocols commonly employed by practicing biologists/chemists (Stems from Malone Educ. Goals C3, D4, and D5).
- Students should be able to apply the principles of Christian Stewardship to biological practice and interpret biological and chemical phenomena within a Christian worldview (Stems from Malone Educ. Goals D2, E1, and E5).

MALONE UNIVERSITY ANNUAL ASSESSMENT REPORT (See Appendix for Raw Data and Detailed Analysis)

Department: *Natural Sciences*
Program: *Life Science Education*
Assessed by: *Jeffrey M. Goff - Dept. of Natural Sciences*
Time Period Covered: *January 2015-December 2015*
Submission Date: *10/31/2016*

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
Demonstrate the capability of integrating data and assessing phenomena within a Christian paradigm (Departmental Outcome A).	1) Average cumulative score ≥ 12; minimum cumulative score of 8; no individual component score of 1 on the Faith and Learning Assessment Instrument as scored by the associated rubric.	Average composite score = 14.41; minimum composite score = 8; # of individual component scores of 1 was 3.	Data here represent the sixth data set ever collected with this instrument. Average composite score and individual composite scores all met the departmental criteria for success. However, 3 individual component scores were not acceptable. Two of the low individual component scores were from a single individual's essays who, we believe, avoided the question due to the sensitivity of the material. As a result, the department reworded the instrument to be less offensive to students whose worldviews differ significantly from Malone's in order to elicit more on-task participation.
Demonstrate a comprehension of the central concepts of chemistry including the major theories and laws which govern chemical phenomena (Departmental Outcome B).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Gen Chem II Exam. 2) ACS Gen Chem II Exam score used as a Pre-Test for obtaining baseline data only (not used to assess success, but merely preparation for freshman chemistry sequence).	1) Mean score on the ACS Gen Chem Exam is 29.14 (-0.80σ). Ten individuals failed to meet the -1.5σ criterion. 2) Class average on ACS Gen Chem pre-test is 18.81 giving strong evidence of student improvement, but the scores of the freshman cohort as it exits is well below the national average (24^{th} percentile)	The 10 low ACS Gen Chem Exam scores and the low average score for the cohort are in keeping with other recent cohorts and are disappointing to the department. The extremely low CCDT results for Fall 2008 - Fall 2010 are evidence that our students enter well below the national average, so cohorts exiting below the national average do not necessarily imply a poor program. The ACS Gen Chem II pre-test scores, when compared to the post-test scores, are extremely strong evidence that our students are improving as a result of our freshman chemistry sequence. The department has concluded that our students enter below the national average and then exit below the national average in spite of the significant improvement in content knowledge. The department responded by developing a new, alternative Gen Chem II course for Zoo and Wildlife Biology Majors. Course is scheduled to run for the first time in Spring 2017.

Demonstrate safe laboratory practices and an environmental ethic as it pertains to chemical use and disposal (Departmental Outcome D).	Minimum scores of 20, 21, and 20 must be obtained respectively on 3 safety projects completed as a component of our Chem 201 course (Stewardship and Safety in Chemical Practice) and graded via associated rubrics. In addition to the composite scores criteria on all 3 projects, minimum individual element scores have also been set.	Of 9 students, only 1 student failed to reach the minimum score of 20 on Safety Project #1 (1 individual element score missed criterion). On Safety Project #2, all students met the minimum composite score criterion of 21 and all individual element scores were satisfactory as well. On Safety Project #3, all students met the minimum composite score criterion of 20, though 1 individual element score missed the minimum standard.	1) Although two individual element scores were low and 1 student failed to meet a minimum composite score, the instructor feels strongly that this was due to a lack of time. The extensive one-on-one time required of the professor/student precluded these individuals from repeating a few of the assessments. Rather than fail the students, the instructor opted to allow the few sub-par scores with the intention of scheduling additional sessions at the next offering to give each student enough opportunities to meet the minimum scores on each project. The same problem was noted in last year's report, so the good intentions of the instructor may not be sufficient to accomplish the desired change. To step the efforts up a notch, the instructor has also incorporated feedback from the class in a proposal to the department that would add an additional credit hour to the class to assure that the assessments have adequate time for completion.
Demonstrate an understanding of the biological characteristics of each of the major kingdoms (Departmental Outcome F)	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Organismal Sub-score.	1) Average Organismal sub-score is 61.1 ($+0.60\sigma$). No individuals failed to meet the -1.5σ criterion.	In light of the successful scores of several recent cohorts on the organismal sub-section of the ETS, the department has opted to not make any programmatic changes at this time. Individuals missing the criterion of -1.5σ on other sub-sections or even as composite scores are a concern for us, but legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist. The department is more concerned when students who have acceptable GPAs routinely miss this threshold. This has occasionally happened, but not routinely. The department has slated this as an agenda item for a future departmental meeting.

Demonstrate an understanding of the fundamental concepts of molecular biology and genetics (Departmental Outcome G).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Molecular Biology and Genetics sub-scores.	1) Average Molecular Biology/Genetics sub-score is 58.8 (+0.45σ). Two individuals failed to meet the –1.50σ criterion.	The composite average score was well-above the national average this year. Although this is cause for celebration, individuals missing the criterion of –1.5σ are a concern for us. This has occasionally happened (two this year), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting.
Demonstrate an understanding of the various factors that impact biological populations (Departmental Outcome H).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Population Biology/Evolution/Ecology sub-score.	1) Average Population Biology/Evolution/Ecology sub-score is 60.4 (+0.61σ). All individuals met the -1.5σ criterion.	In light of the successful scores of several recent cohorts on the population biology/evolution/ecology sub-section, the department has opted to not make any programmatic changes at this time. The institutional cohort averages on this section are some of the highest and represent strengths of the department's biology programs.

Demonstrate an ability to properly relate biological structure and function (Departmental Outcome I).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Cell Biology sub-score.	1) Average Cell Biology sub-score is 53.9 (+0.07σ). A single individual failed to meet the –1.5σ criterion.	This sub-section of the ETS has historically been lowest. For this reason, a curricular change was proposed and passed by the full faculty that added one credit hour to the introductory Cell Biology course effective Fall 2012. It is still too early to tell if this curricular change will impact our scores on this section (i.e., Spring 2016 graduating class will be the first to take the ETS having benefited from this curricular change). Individuals missing the criterion of –1.5σ on other sub-sections or even as composite scores are a concern for us. This has occasionally happened (one this year on this sub-section), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Lastly, in last year's report, we indicated that we would like to add an additional instrument to assess this outcome -- a minimum score of 70% on the cell biology content of our in-house biology post-test. This has proved more difficult than at first anticipated and was not completed for this report. Since so many of our curricular/personnel changes should begin impacting the 2016 report data, we are holding off on the new assessment until then as well.
Demonstrate the capability of working with animals in safe and ethical ways that conform to state and national guidelines (Departmental Outcome J).	1) Minimum score of 35/60 on an Animal Care Portfolio with no single sub-score lower than 2.	1) All Animal Care Portfolio composite scores met the departmental criteria for success, while five individual element scores did not.	This instrument is still fairly new (this is the third year of good data collected with this instrument). Last year, the department began checking for completion of the Animal Care Portfolio during advising week of a student's junior spring; still, some students procrastinated on their portfolios and did not turn them in until their senior year. The department should be able to enforce this more effectively by several means. The simplest alternative is to not clear students to register for the fall semester of their senior year if their portfolios are not in hand.

Demonstrate the capability of analyzing and reporting empirical data from the biological sciences (Departmental Outcome K).	Instrument has been dropped in favor of a newer one that has yet to be developed.	NO DATA	Previous reports have indicated that our department has been having a long and rather continuous conversation about the need to implement a research methods course. This course was finally developed and approved by the department and full faculty. It is scheduled to run in Fall 2016 for the first time. The exact nature of the assessment instrument is still in flux, but the department has completed the most difficult step in addressing this shortfall. It will be possible to build an appropriate assessment instrument into the course as it runs in Fall 2016.
Demonstrate the level of content mastery required for potential successful performance in secondary science education (Departmental Outcome O).	1) 100% passing scores on appropriate OAE test.	1) One student took the Biology OAE test in 2015. This student failed with a score of 213 (220 required to pass).	1) Malone has a long history of 100% pass rates on the Praxis II tests. The fact that this student failed an OAE test, though disappointing, does not warrant any programmatic changes at this time. However, the possibility that the OAE test might be more rigorous is something the department must consider and be proactive about. If another student fails this test within the next 3-5 years, the department believes that a much more serious response is in order. Incidentally, the student who failed this test retook the test and passed it at a later date (data to be included in 2016 report).

Program Name: Life Science – Chemistry Education

Assessed by: Jeff Goff, Dept. of Natural Sciences

Date/Cycle of Assessment: Submitted on 10/31/2016;
Reporting cycle of January 2015 – December 2015

Mission Statement:

The Malone University Department of Natural Sciences exists to engage students in the study of God's majesty and character by exploring His handiwork as it is revealed in Nature, both animate and inanimate; to promote the wise and thoughtful stewardship of the natural resources He has entrusted to us; and to encourage students to demonstrate God's love in their respective communities by using the knowledge and skills they acquire here.

Program Goals:

- Students should comprehend the central concepts of biology and chemistry, the underlying assumptions of biological knowledge and chemical knowledge, and be able to employ the methods of inquiry commonly utilized by practicing biologists and chemists at a level sufficient for competent teaching at the high school level (Stems from Malone Educ. Goals A4, D1, and D3).
- Students should become proficient in solving biological and chemical problems using both quantitative and qualitative approaches and in analyzing / interpreting data generated by experimental protocols commonly employed by practicing biologists/chemists (Stems from Malone Educ. Goals C3, D4, and D5).
- Students should be able to apply the principles of Christian Stewardship to biological practice and interpret biological and chemical phenomena within a Christian worldview (Stems from Malone Educ. Goals D2, E1, and E5).

MALONE UNIVERSITY ANNUAL ASSESSMENT REPORT (See Appendix for Raw Data and Detailed Analysis)

Department: *Natural Sciences*
Program: *Life Science – Chemistry Education*
Assessed by: *Jeffrey M. Goff - Dept. of Natural Sciences*
Time Period Covered: *January 2015-December 2015*
Submission Date: *10/31/2016*

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
Demonstrate the capability of integrating data and assessing phenomena within a Christian paradigm (Departmental Outcome A).	1) Average cumulative score ≥ 12; minimum cumulative score of 8; no individual component score of 1 on the Faith and Learning Assessment Instrument as scored by the associated rubric.	Average composite score = 14.41; minimum composite score = 8; # of individual component scores of 1 was 3.	Data here represent the sixth data set ever collected with this instrument. Average composite score and individual composite scores all met the departmental criteria for success. However, 3 individual component scores were not acceptable. Two of the low individual component scores were from a single individual's essays who, we believe, avoided the question due to the sensitivity of the material. As a result, the department reworded the instrument to be less offensive to students whose worldviews differ significantly from Malone's in order to elicit more on-task participation.
Demonstrate a comprehension of the central concepts of chemistry including the major theories and laws which govern chemical phenomena (Departmental Outcome B).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Gen Chem II Exam. 2) ACS Gen Chem II Exam score used as a Pre-Test for obtaining baseline data only (not used to assess success, but merely preparation for freshman chemistry sequence).	1) Mean score on the ACS Gen Chem Exam is 29.14 (-0.80σ). Ten individuals failed to meet the -1.5σ criterion. 2) Class average on ACS Gen Chem pre-test is 18.81 giving strong evidence of student improvement, but the scores of the freshman cohort as it exits is well below the national average (24^{th} percentile)	The 10 low ACS Gen Chem Exam scores and the low average score for the cohort are in keeping with other recent cohorts and are disappointing to the department. The extremely low CCDT results for Fall 2008 - Fall 2010 are evidence that our students enter well below the national average, so cohorts exiting below the national average do not necessarily imply a poor program. The ACS Gen Chem II pre-test scores, when compared to the post-test scores, are extremely strong evidence that our students are improving as a result of our freshman chemistry sequence. The department has concluded that our students enter below the national average and then exit below the national average in spite of the significant improvement in content knowledge. The department responded by developing a new, alternative Gen Chem II course for Zoo and Wildlife Biology Majors. Course is scheduled to run for the first time in Spring 2017.

Demonstrate an understanding of the relationships between structure and behavior of the chemical elements in their various forms and combinations (Departmental Outcome C).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Organic Chem Exam. 2) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Inorganic Chem Exam. 3) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS chemistry exam Organic and Inorganic Sub-scores.	1) Mean score on the ACS Organic Chem Exam was 36.45 (–0.23σ). No individuals failed to meet the -1.5σ criterion. 2) Most recent mean score on the ACS Inorganic Chem Exam was 25.67 (–0.33σ). Only 1 individual failed to meet the –1.5σ criterion. 3) Average sub-scores on the Organic and Inorganic sections of the ETS chemistry exam are 61.0 and 56.7 respectively (+0.89σ and +0.56σ respectively). No individuals failed to meet the –1.5σ criterion on either sub-section).	1) This data set represents the fifth year in a row that ACS composite scores have met the departmental criteria for success. This may be the result of two changes that have been implemented in the Organic Chemistry sequence within the last 5 years. It is still too early to draw any conclusions regarding the implementation of these changes, though. 2) Composite scores on the ACS Inorganic exam have met the minimum standard set by the department since 2009. The occasional individual still misses the –1.5σ criterion, however. The success of our students on the ETS inorganic sub-section, however, is comforting and leads us to believe that no programmatic changes are warranted at this time. 3) ETS scores were acceptable again this year. The department has opted to not make any changes to the curriculum at this time.
Demonstrate safe laboratory practices and an environmental ethic as it pertains to chemical use and disposal (Departmental Outcome D).	Minimum scores of 20, 21, and 20 must be obtained respectively on 3 safety projects completed as a component of our Chem 201 course (Stewardship and Safety in Chemical Practice) and graded via associated rubrics. In addition to the composite scores criteria on all 3 projects, minimum individual element scores have also been set.	Of 9 students, only 1 student failed to reach the minimum score of 20 on Safety Project #1 (1 individual element score missed criterion). On Safety Project #2, all students met the minimum composite score criterion of 21 and all individual element scores were satisfactory as well. On Safety Project #3, all students met the minimum composite score criterion of 20, though 1 individual element score missed the minimum standard.	1) Although two individual element scores were low and 1 student failed to meet a minimum composite score, the instructor feels strongly that this was due to a lack of time. The extensive one-on-one time required of the professor/student precluded these individuals from repeating a few of the assessments. Rather than fail the students, the instructor opted to allow the few sub-par scores with the intention of scheduling additional sessions at the next offering to give each student enough opportunities to meet the minimum scores on each project. The same problem was noted in last year's report, so the good intentions of the instructor may not be sufficient to accomplish the desired change. To step the efforts up a notch, the instructor has also incorporated feedback from the class in a proposal to the department that would add an additional credit hour to the class to assure that the assessments have adequate time for completion.

Demonstrate an ability to analyze various kinds of experimental data used in the chemical disciplines including the output of various instrumental techniques (Departmental Outcome E).	1) Each student must obtain a minimum cumulative score of 15 on each of 5 instrumental assignments (i.e., IR/MS/NMR assignments) completed in Chem 322.	All students who passed the class met the minimum score of 15 on all 5 assignments.	Since 2012, a passing grade on each assignment has been officially required in order to pass the class. In Spring 2014, the instructor implemented a policy of assigning a grade of "Incomplete" until all students had met the minimum criteria. As a result, the number of deficient criteria has dropped dramatically. At the encouragement of the Chemistry Program's external reviewers, the departmental chemistry faculty have agreed to add an additional 4 instrumental assignments to the existing slate of 5. The chemistry faculty are hoping to implement these new assignments within the next one or two reporting cycles.
Demonstrate an understanding of the biological characteristics of each of the major kingdoms (Departmental Outcome F)	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Organismal Sub-score.	1) Average Organismal sub-score is 61.1 ($+0.60\sigma$). No individuals failed to meet the -1.5σ criterion.	In light of the successful scores of several recent cohorts on the organismal sub-section of the ETS, the department has opted to not make any programmatic changes at this time. Individuals missing the criterion of -1.5σ on other sub-sections or even as composite scores are a concern for us, but legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist. The department is more concerned when students who have acceptable GPAs routinely miss this threshold. This has occasionally happened, but not routinely. The department has slated this as an agenda item for a future departmental meeting.
Demonstrate an understanding of the fundamental concepts of molecular biology and genetics (Departmental Outcome G).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Molecular Biology and Genetics sub-scores.	1) Average Molecular Biology/Genetics sub-score is 58.8 ($+0.45\sigma$). Two individuals failed to meet the -1.50σ criterion.	The composite average score was well-above the national average this year. Although this is cause for celebration, individuals missing the criterion of -1.5σ are a concern for us. This has occasionally happened (two this year), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting.

Demonstrate an understanding of the various factors that impact biological populations (Departmental Outcome H).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Population Biology/Evolution/Ecology sub-score.	1) Average Population Biology/Evolution/Ecology sub-score is 60.4 (+0.61σ). All individuals met the -1.5σ criterion.	In light of the successful scores of several recent cohorts on the population biology/evolution/ecology sub-section, the department has opted to not make any programmatic changes at this time. The institutional cohort averages on this section are some of the highest and represent strengths of the department's biology programs.
Demonstrate an ability to properly relate biological structure and function (Departmental Outcome I).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Cell Biology sub-score.	1) Average Cell Biology sub-score is 53.9 (+0.07σ). A single individual failed to meet the –1.5σ criterion.	This sub-section of the ETS has historically been lowest. For this reason, a curricular change was proposed and passed by the full faculty that added one credit hour to the introductory Cell Biology course effective Fall 2012. It is still too early to tell if this curricular change will impact our scores on this section (i.e., Spring 2016 graduating class will be the first to take the ETS having benefited from this curricular change). Individuals missing the criterion of –1.5σ on other sub-sections or even as composite scores are a concern for us. This has occasionally happened (one this year on this sub-section), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Lastly, in last year's report, we indicated that we would like to add an additional instrument to assess this outcome -- a minimum score of 70% on the cell biology content of our in-house biology post-test. This has proved more difficult than at first anticipated and was not completed for this report. Since so many of our curricular/personnel changes should begin impacting the 2016 report data, we are holding off on the new assessment until then as well.

Demonstrate the capability of working with animals in safe and ethical ways that conform to state and national guidelines (Departmental Outcome J).	1) Minimum score of 35/60 on an Animal Care Portfolio with no single sub-score lower than 2.	1) All Animal Care Portfolio composite scores met the departmental criteria for success, while five individual element scores did not.	This instrument is still fairly new (this is the third year of good data collected with this instrument). Last year, the department began checking for completion of the Animal Care Portfolio during advising week of a student's junior spring; still, some students procrastinated on their portfolios and did not turn them in until their senior year. The department should be able to enforce this more effectively by several means. The simplest alternative is to not clear students to register for the fall semester of their senior year if their portfolios are not in hand.
Demonstrate the capability of analyzing and reporting empirical data from the biological sciences (Departmental Outcome K).	Instrument has been dropped in favor of a newer one that has yet to be developed.	NO DATA	Previous reports have indicated that our department has been having a long and rather continuous conversation about the need to implement a research methods course. This course was finally developed and approved by the department and full faculty. It is scheduled to run in Fall 2016 for the first time. The exact nature of the assessment instrument is still in flux, but the department has completed the most difficult step in addressing this shortfall. It will be possible to build an appropriate assessment instrument into the course as it runs in Fall 2016.
Demonstrate the level of content mastery required for potential successful performance in secondary science education (Departmental Outcome O).	1) 100% passing scores on appropriate OAE test.	1) One student took the Integrated Science OAE test in 2015. This student passed with a score of 249 (220 required to pass).	1) Malone has a long history of 100% pass rates on the Praxis II tests. The fact that this student passed is another affirmation of the program's strength. However, the possibility that the OAE test might be more rigorous is something the department must consider and be proactive about. If a student fails this test within the next 3-5 years, the department believes that a much more serious response is in order.

Program Name: Zoo and Wildlife Biology (both tracks assessed)

Assessed by: Jeff Goff, Dept. of Natural Sciences

Date/Cycle of Assessment: Submitted on 10/31/2016;
Reporting cycle of January 2015 – December 2015

Mission Statement:

The Malone University Department of Natural Sciences exists to engage students in the study of God's majesty and character by exploring His handiwork as it is revealed in Nature, both animate and inanimate; to promote the wise and thoughtful stewardship of the natural resources He has entrusted to us; and to encourage students to demonstrate God's love in their respective communities by using the knowledge and skills they acquire here.

Program Goals:

- Students should comprehend the central concepts of biology, the underlying assumptions of biological knowledge, and be able to employ the methods of inquiry commonly utilized by practicing biologists at a level sufficient for entrance into graduate school, professional schools, and other biological vocations (Stems from Malone Educ. Goals A4, D1, and D3).
- Students should become proficient in solving biological problems using both quantitative and qualitative approaches and in analyzing / interpreting data generated by experimental protocols commonly employed by practicing biologists (Stems from Malone Educ. Goals C3, D4, and D5).
- Students should be able to apply the principles of Christian Stewardship to biological practice and interpret biological phenomena within a Christian worldview (Stems from Malone Educ. Goals D2, E1, and E5).

MALONE UNIVERSITY ANNUAL ASSESSMENT REPORT (See Appendix for Raw Data and Detailed Analysis)

Department: *Natural Sciences*
Program: *Zoo and Wildlife Biology*
Assessed by: *Jeffrey M. Goff - Dept. of Natural Sciences*
Time Period Covered: *January 2015-December 2015*
Submission Date: *10/31/2016*

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
Demonstrate the capability of integrating data and assessing phenomena within a Christian paradigm (Departmental Outcome A).	1) Average cumulative score ≥ 12; minimum cumulative score of 8; no individual component score of 1 on the Faith and Learning Assessment Instrument as scored by the associated rubric.	Average composite score = 14.41; minimum composite score = 8; # of individual component scores of 1 was 3.	Data here represent the sixth data set ever collected with this instrument. Average composite score and individual composite scores all met the departmental criteria for success. However, 3 individual component scores were not acceptable. Two of the low individual component scores were from a single individual's essays who, we believe, avoided the question due to the sensitivity of the material. As a result, the department reworded the instrument to be less offensive to students whose worldviews differ significantly from Malone's in order to elicit more on-task participation.
Demonstrate a comprehension of the central concepts of chemistry including the major theories and laws which govern chemical phenomena (Departmental Outcome B).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ACS Gen Chem II Exam. 2) ACS Gen Chem II Exam score used as a Pre-Test for obtaining baseline data only (not used to assess success, but merely preparation for freshman chemistry sequence).	1) Mean score on the ACS Gen Chem Exam is 29.14 (-0.80σ). Ten individuals failed to meet the -1.5σ criterion. 2) Class average on ACS Gen Chem pre-test is 18.81 giving strong evidence of student improvement, but the scores of the freshman cohort as it exits is well below the national average (24^{th} percentile)	The 10 low ACS Gen Chem Exam scores and the low average score for the cohort are in keeping with other recent cohorts and are disappointing to the department. The extremely low CCDT results for Fall 2008 - Fall 2010 are evidence that our students enter well below the national average, so cohorts exiting below the national average do not necessarily imply a poor program. The ACS Gen Chem II pre-test scores, when compared to the post-test scores, are extremely strong evidence that our students are improving as a result of our freshman chemistry sequence. The department has concluded that our students enter below the national average and then exit below the national average in spite of the significant improvement in content knowledge. The department responded by developing a new, alternative Gen Chem II course for Zoo and Wildlife Biology Majors. Course is scheduled to run for the first time in Spring 2017.

Demonstrate safe laboratory practices and an environmental ethic as it pertains to chemical use and disposal (Departmental Outcome D).	Minimum scores of 20, 21, and 20 must be obtained respectively on 3 safety projects completed as a component of our Chem 201 course (Stewardship and Safety in Chemical Practice) and graded via associated rubrics. In addition to the composite scores criteria on all 3 projects, minimum individual element scores have also been set.	Of 9 students, only 1 student failed to reach the minimum score of 20 on Safety Project #1 (1 individual element score missed criterion). On Safety Project #2, all students met the minimum composite score criterion of 21 and all individual element scores were satisfactory as well. On Safety Project #3, all students met the minimum composite score criterion of 20, though 1 individual element score missed the minimum standard.	1) Although two individual element scores were low and 1 student failed to meet a minimum composite score, the instructor feels strongly that this was due to a lack of time. The extensive one-on-one time required of the professor/student precluded these individuals from repeating a few of the assessments. Rather than fail the students, the instructor opted to allow the few sub-par scores with the intention of scheduling additional sessions at the next offering to give each student enough opportunities to meet the minimum scores on each project. The same problem was noted in last year's report, so the good intentions of the instructor may not be sufficient to accomplish the desired change. To step the efforts up a notch, the instructor has also incorporated feedback from the class in a proposal to the department that would add an additional credit hour to the class to assure that the assessments have adequate time for completion.
Demonstrate an understanding of the biological characteristics of each of the major kingdoms (Departmental Outcome F)	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Organismal Sub-score.	1) Average Organismal sub-score is 61.1 ($+0.60\sigma$). No individuals failed to meet the -1.5σ criterion.	In light of the successful scores of several recent cohorts on the organismal sub-section of the ETS, the department has opted to not make any programmatic changes at this time. Individuals missing the criterion of -1.5σ on other sub-sections or even as composite scores are a concern for us, but legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist. The department is more concerned when students who have acceptable GPAs routinely miss this threshold. This has occasionally happened, but not routinely. The department has slated this as an agenda item for a future departmental meeting.
Demonstrate an understanding of the fundamental concepts of molecular biology and genetics (Departmental Outcome G).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Molecular Biology and Genetics sub-scores.	1) Average Molecular Biology/Genetics sub-score is 58.8 ($+0.45\sigma$). Two individuals failed to meet the -1.50σ criterion.	The composite average score was well-above the national average this year. Although this is cause for celebration, individuals missing the criterion of -1.5σ are a concern for us. This has occasionally happened (two this year), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting.

Demonstrate an understanding of the various factors that impact biological populations (Departmental Outcome H).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Population Biology/Evolution/Ecology sub-score.	1) Average Population Biology/Evolution/Ecology sub-score is 60.4 (+0.61σ). All individuals met the -1.5σ criterion.	In light of the successful scores of several recent cohorts on the population biology/evolution/ecology sub-section, the department has opted to not make any programmatic changes at this time. The institutional cohort averages on this section are some of the highest and represent strengths of the department's biology programs.
Demonstrate an ability to properly relate biological structure and function (Departmental Outcome I).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam Cell Biology sub-score.	1) Average Cell Biology sub-score is 53.9 (+0.07σ). A single individual failed to meet the –1.5σ criterion.	This sub-section of the ETS has historically been lowest. For this reason, a curricular change was proposed and passed by the full faculty that added one credit hour to the introductory Cell Biology course effective Fall 2012. It is still too early to tell if this curricular change will impact our scores on this section (i.e., Spring 2016 graduating class will be the first to take the ETS having benefited from this curricular change). Individuals missing the criterion of –1.5σ on other sub-sections or even as composite scores are a concern for us. This has occasionally happened (one this year on this sub-section), but not routinely. Although legitimate reasons for individual students missing the cutoff (e.g., illness, test anxiety) do exist, the department has an intuition that it can do more. It remains to be seen how the recent personnel changes in the biology faculty will impact this weakness, but early insights should begin to become evident in the 2016 Assessment Report. In addition, several options are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Lastly, in last year's report, we indicated that we would like to add an additional instrument to assess this outcome -- a minimum score of 70% on the cell biology content of our in-house biology post-test. This has proved more difficult than at first anticipated and was not completed for this report. We are holding off on the new assessment until 2016.

Demonstrate the capability of working with animals in safe and ethical ways that conform to state and national guidelines (Departmental Outcome J).	1) Minimum score of 35/60 on an Animal Care Portfolio with no single sub-score lower than 2.	1) All Animal Care Portfolio composite scores met the departmental criteria for success, while five individual element scores did not.	This instrument is still fairly new (this is the third year of good data collected with this instrument). Last year, the department began checking for completion of the Animal Care Portfolio during advising week of a student's junior spring; still, some students procrastinated on their portfolios and did not turn them in until their senior year. The department should be able to enforce this more effectively by several means. The simplest alternative is to not clear students to register for the fall semester of their senior year if their portfolios are not in hand.
Demonstrate the capability of analyzing and reporting empirical data from the biological sciences (Departmental Outcome K).	Instrument has been dropped in favor of a newer one that has yet to be developed.	NO DATA	Previous reports have indicated that our department has been having a long and rather continuous conversation about the need to implement a research methods course. This course was finally developed and approved by the department and full faculty. It is scheduled to run in Fall 2016 for the first time. The exact nature of the assessment instrument is still in flux, but the department has completed the most difficult step in addressing this shortfall. It will be possible to build an appropriate assessment instrument into the course as it runs in Fall 2016.
Demonstrate the level of content mastery required for potential successful performance in graduate school biology programs or professional schools (Departmental Outcome N).	1) Mean score no lower than 0.5σ below national mean and no individual score lower than 1.5σ below the national mean on the ETS biology exam composite score. 2) Mean score no lower than 31/50 and no individual score lower than 24/50 on the departmental biology Post-Test	1) Average ETS composite score is 160.1 (+0.53σ). Lowest individual score is 132 (-1.64σ). 2) Mean score on in-house Biology post-test is 34.07. One individual failed to meet the minimum score of 24 (lowest score was 17).	1) As has been the case for several years, the average ETS composite score has been meeting the departmental standard. Occasionally, an individual student fails to meet the minimum score – this happened again this year. The score of 132 in this year's data marks the second lowest ETS composite score ever obtained by a Malone student. Although legitimate reasons for individual students missing the cutoff do exist (e.g., illness, test anxiety), the department has an intuition that it can do more. 2) The score of 17 in this year's data was achieved by the same student that achieved the 132 on the ETS exam. This student obtained a score of 17 on the pre-test as well, and the lack of change, at face value, indicates that this student did not absorb any content knowledge whatsoever. Results of this nature are most unsettling. Several options to address the occasional outlier are currently being discussed in the department and have been slated to be agenda items at an upcoming department meeting. Until the impact of the extra credit hour in Biol 144 and the impact of biology faculty personnel changes are manifested, it seems premature to us to alter the curriculum.