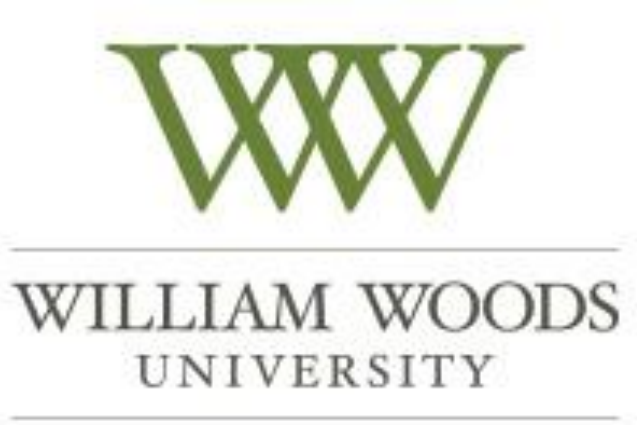

Biology BS

Annual Assessment 2017-2018

Annual Assessment 17-18

Biology BS

Program Profile

Program Mission Statement
Please insert your program mission statement here

A professionally oriented program with two concentrations specifically designed to both educate students in the biological sciences and prepare them for acceptance into graduate or professional programs.

Program Data

Delivery Method

Traditional On Campus (selected)
Online
Hybrid

	Minors	Majors
2016-2017		63
2017-2018		57

Concentrations 2016-17
If your program contains concentrations, please list the concentrations and the number of students identified within each concentration.

	Pre-Med	Pre-Vet
2016-2017	36	34
2017-2018	21	14

2016-2017 *There is a discrepancy between the total number of concentrations (34 PreVet and 36 PreMed) resulting in 70 majors, yet the number of declared B.S. majors being 63

2017-2018 *There is a discrepancy between the total number of concentrations (14 PreVet and 21 PreMed) resulting in 35 majors, yet the number of declared B.S. majors being 57.

Student Demographics
Program goals for student retention, persistence and degree completion are? What do the persistence numbers mean to the faculty in the program? Are your persistence numbers what you expected? If not, how could the numbers be improved? What is the optimal enrollment for the program?

Our Department has a program goal of 75% retention between freshman and sophomores, a 90% persistence per year, and with a 100% completing the program that enter their Senior year.

The retention data shows that 55.6% for students they enter during 2012/2013, so we clearly did not meet our benchmark. We contribute the low retention rate, in part, due to the fact that we have had signifigant faculty turnover in the department as since 2014/2015 students have had to deal with at least one new science faculty in three of the five years.

By our program goal mentioned above, we would expect a graduation rate ~60%. The current data shows a graduation rate of 61.2% for new students who entered 2012/2013, showing even though our retention was lower than we would like, we wee successful at graduating the students we did retain.

Is the Program Externally Accredited

Yes
No (selected)

External Accreditation
Name the Accrediting Agency or entity including the last review/approval. Is there an accrediting body for the field of study? If yes, what is the name of the group. Is the program seeking accreditation?If no, why?

N/A

Program Assessment

Standard/Outcome

Identifier	Description
WWU2016.1	Major Field Competence: Students will demonstrate excellence in an academic or professional discipline, and engage in the process of academic discovery.
WWU2016.2	Ethics: Students will exhibit values and behaviors that address self- respect and respect for others that will enable success and participation in the larger society.
WWU2016.3	Self-Liberation: Students will develop an honest understanding and appreciation of themselves and others resulting in an ability to make individual decisions.
WWU2016.4	Lifelong Education: Students will possess an intellectual curiosity and desire for continual learning both within and beyond formal education in preparation for participation in a global society.

Additional Standards/Outcomes

BIO.1	Evolution: Articulate knowledge that life evolved over time via mechanisms of mutation, natural selection, and genetic drift, and that there is concrete evidence for this fundamental concept _ evolution from common ancestry _ in the unity of numerous biological processes among species.
BIO.2	Interdisciplinary: Demonstrate that fundamental principles and laws of chemistry and physics are also underpinnings that govern complex living systems.
BIO.3	Diversity in structures, functions, and systems: Demonstrate and model, through reductionist and holistic approaches, the interconnectedness of life along a continuum from molecular structures to interactions among organisms and with ecosystems.
BIO.4	Information and Engergy: Demonstrate knowledge of major conserved metabolic, signaling, heritable, and molecular processes of all life on Earth.

Concentrations

BIO Pre-Med.5	Construct a competitive candidacy for admission to undergraduate medical studies: integrating a strong academic record, proof of observation of medical practice, and identification of other medical school specific admission factors that the individual student must meet.
BIO Pre-Vet.5	Construct a competitive candidacy for admission to undergraduate Veterinary medical programs integrating a strong academic record, proof of observation of veterinary practices in two or more areas of the veterinary animal categories, and identification of other veterinary school specific admission factors that the individual student must meet.

General Education Alignment to Program
How do the General Education criteria align with the Program Objectives? What courses within your program build upon skills learned in general education courses (please list the program course and the general education criteria). The General Education clusters are: Critical Analysis, Creative Expression, Quantitative Inquiry, and Society & the Individual. See attached for more detailed breakdown.

GE_Cluster_Descriptions_FINAL_Version_Approved.docx

Curriculum Map

A - Assessed
R - Reinforced
I - Introduced
M - Master

Bachelor of Science - Core Assessment

	BIO 114	**BIO 124**	**BIO 231**	**BIO 310**	**BIO 330**	**BIO 401**	**BIO 450**	**CHM 114**	**CHM 124**
BIO.1 Evolution: Articulate knowledge that life evolved over time via mechanisms of mutation, natural selection, and genetic drift, and that there is concrete evidence for this fundamental concept _ evolution from common ancestry _ in the unity of numerous biological processes among species.	I	R, A	R	R	R	A, M			
BIO.2 Interdisciplinary: Demonstrate that fundamental principles and laws of chemistry and physics are also underpinnings that govern complex living systems.	I, A	R	R	R	R	R		I	R
BIO.3 Diversity in structures, functions, and systems: Demonstrate and model, through reductionist and holistic approaches, the interconnectedness of life along a continuum from molecular structures to interactions among organisms and with ecosystems.	I	A, R	R	R	R	M		I	R
BIO.4 Information and Energy: Demonstrate knowledge of major conserved metabolic, signaling, heritable, and molecular processes of all life on Earth.	I	R	A, R			R			

	CHM 314	PHY 201	PHY 212	Student Performance Review
BIO.1 Evolution: Articulate knowledge that life evolved over time via mechanisms of mutation, natural selection, and genetic drift, and that there is concrete evidence for this fundamental concept _ evolution from common ancestry _ in the unity of numerous biological processes among species.				A
BIO.2 Interdisciplinary: Demonstrate that fundamental principles and laws of chemistry and physics are also underpinnings that govern complex living systems.	R	I	R	A
BIO.3 Diversity in structures, functions, and systems: Demonstrate and model, through reductionist and holistic approaches, the interconnectedness of life along a continuum from molecular structures to interactions among organisms and with ecosystems.	R			A
BIO.4 Information and Energy: Demonstrate knowledge of major conserved metabolic, signaling, heritable, and molecular processes of all life on Earth.				A

Biology BS: PreMed Concentration(Imported)

	BIO 313	BIO 317	CHM 324	CHM 440	MAT 124	MAT 214	MAT 304	BIO 450	SPR
BIO Pre-Med.5 Construct a competitive candidacy for admission to undergraduate medical studies: integrating a strong academic record, proof of observation of medical practice, and identification of other medical school specific admission factors that the individual student must meet.	R	R	R	R	R	R	R	A, M	A
BIO.1 Evolution: Articulate knowledge that life evolved over time via mechanisms of mutation, natural selection, and genetic drift, and that there is concrete evidence for this fundamental concept _ evolution from common ancestry _ in the unity of numerous biological processes among species.	R	R							
BIO.2 Interdisciplinary: Demonstrate that fundamental principles and laws of chemistry and physics are also underpinnings that govern complex living systems.	R	R	M	M	R	R	R		
BIO.3 Diversity in structures, functions, and systems: Demonstrate and model, through reductionist and holistic approaches, the interconnectedness of life along a continuum from molecular structures to interactions among organisms and with ecosystems.	M	M	R	R					
BIO.4 Information and Engergy: Demonstrate knowledge of major conserved metabolic, signaling, heritable, and molecular processes of all life on Earth.	R	R	M	M					

Biology BS: PreVet Concentration(Imported)

	BIO 303	CHM 324	CHM 440	MAT 124	MAT 304	EQU 111	EQU 117	EQS 306
BIO Pre-Vet.5 Construct a competitive candidacy for admission to undergraduate Veterinary medical programs integrating a strong academic record, proof of observation of veterinary practices in two or more areas of the veterinary animal categories, and identification of other veterinary school specific admission factors that the individual student must meet.	R	R	R	R	R	I	I	R
BIO.1 Evolution: Articulate knowledge that life evolved over time via mechanisms of mutation, natural selection, and genetic drift, and that there is concrete evidence for this fundamental concept _ evolution from common ancestry _ in the unity of numerous biological processes among species.	R							R
BIO.2 Interdisciplinary: Demonstrate that fundamental principles and laws of chemistry and physics are also underpinnings that govern complex living systems.	R	R, M	M	R	R			R
BIO.3 Diversity in structures, functions, and systems: Demonstrate and model, through reductionist and holistic approaches, the interconnectedness of life along a continuum from molecular structures to interactions among organisms and with ecosystems.	M	R	R					M
BIO.4 Information and Energy: Demonstrate knowledge of major conserved metabolic, signaling, heritable, and molecular processes of all life on Earth.	M	M	M					R

	EQS 376	EQS 404	BIO 450	SPR
BIO Pre-Vet.5 Construct a competitive candidacy for admission to undergraduate Veterinary medical programs integrating a strong academic record, proof of observation of veterinary practices in two or more areas of the veterinary animal categories, and identification of other veterinary school specific admission factors that the individual student must meet.	R	M	A, M	A
BIO.1 Evolution: Articulate knowledge that life evolved over time via mechanisms of mutation, natural selection, and genetic drift, and that there is concrete evidence for this fundamental concept _ evolution from common ancestry _ in the unity of numerous biological processes among species.	R			
BIO.2 Interdisciplinary: Demonstrate that fundamental principles and laws of chemistry and physics are also underpinnings that govern complex living systems.	R	R		
BIO.3 Diversity in structures, functions, and systems: Demonstrate and model, through reductionist and holistic approaches, the interconnectedness of life along a continuum from molecular structures to interactions among organisms and with ecosystems.	M	M		
BIO.4 Information and Energy: Demonstrate knowledge of major conserved metabolic, signaling, heritable, and molecular processes of all life on Earth.	R	M		

Assessment Findings

Assessment Findings for the Assessment Measure level for Bachelor of Science - Core Assesment(Imported)

BIO.1 Evolution: Articulate knowledge that life evolved over time via mechanisms of mutation, natural selection, and genetic drift, and that there is concrete evidence for this fundamental concept _ evolution from common ancestry _ in the unity of numerous biological processes among species.

Assessment Measures

BIO 124				
Assessment Measure	**Criterion**	**Summary**	**Attachments of the Assessments**	**Improvement Narratives**
Direct - Final Exam	Has the criterion Questions from the lecture Final Exam (BIO124) that were relevant to objective 1 were selected for assessment. The benchmark is 70% of the students at Proficient or better. Proficient is defined as 70% or better on the assessed questions. been met yet? Met	91% of the students (n=34) scored 70% or better on the six questions assessed	BIO_124_OBJ_1.xlsx	- Curriculum Revision: Remove assessing this objective from BIO124 as this Objective is already assessed twice, BIO401 (Evolution) and the Major Field Test.

BIO 401				
Assessment Measure	**Criterion**	**Summary**	**Attachments of the Assessments**	**Improvement Narratives**
Direct - Final Exam	Has the criterion Questions from the lecture Final Exam (BIO401) that were relevant to objective 3 were selected for assessment. The benchmark is 70% of the students at Proficient or better. Proficient is defined as 70% or better on the assessed questions. been met yet? Not met	Only 63% of the students (n=19) scored 70% or better on the six questions assessed	BIO_401_OBJ_1.xlsx	- Revise Assignment for Assessment: Near end of the course have a quiz that explicitly addresses this Objective Current benchmark will be maintained

SPR				
Assessment Measure	**Criterion**	**Summary**	**Attachments of the Assessments**	**Improvement Narratives**
Direct - Interview	Has the criterion Students are asked a question regarding some aspect of Evolution in which they must answer based on the knowledge they have gained through	Our students (n=19) averaged a score of 3.39 (scale 1-5) on this interview question	Student_Performance_Days_Interview_Results_for_Objectives_1_and_3__Spring_2018.xlsx	- Revise Program Benchmark: Revise to have 70% of students scoring a 3.5/5 or better on the question - Refine Assessment Tool: Move this from a Direct Interview

	various Biology Courses. Benchmark: Average score for all students in the major 3/5 or higher been met yet? Met			format to a more Direct Quiz/Exam based assessment using VIA
Direct - External Testing	Has the criterion Major Field Test - Section: III Benchmark = Average score of 53 or higher on section, with 60% of students scoring a 46 or higher. been met yet? Met	86% of our students (n=14) scored a 46 or higher on Section III of the MFT and the average score for those students was 53, meaning both benchmarks were met this portion of the MFT.	Biology_MFT_Departmental_Roster_with_Section_Subscores_Seniors_Spring_2018.pdf	
Direct - External Testing	Has the criterion Major Field Test - Section: IV Benchmark = Average score of 53 or higher on section, with 60% of students scoring a 51 or higher. been met yet? Met	93% of our students (n=14) scored a 51 or higher on Section IV of the MFT and the average score for those students was 59, meaning both benchmarks were met this portion of the MFT. See attachment for Bio Objective 1: Direct - External Testing - Major Field Test - Section: III for full results		

BIO.2 Interdisciplinary: Demonstrate that fundamental principles and laws of chemistry and physics are also underpinnings that govern complex living systems.

Assessment Measures

BIO 114				
Assessment Measure	**Criterion**	**Summary**	**Attachments of the Assessments**	**Improvement Narratives**
Direct - Final Exam	Has the criterion Questions from the lecture Third Exam (BIO114) that were relevant to objective 2 were selected for assessment. The benchmark is 70% of	84% of the students were proficient or better (n = 48).	Assesment_questions_bio_114_2017.docx	

	the students at Proficient or better. Proficient is defined as 70% or better on the assessed questions. been met yet? Met			

SPR				
Assessment Measure	**Criterion**	**Summary**	**Attachments of the Assessments**	**Improvement Narratives**
Direct - External Testing	Has the criterion Major Field Test - Section: I Benchmark = Average score of 53 or higher on section, with 60% of students scoring a 51 or higher. been met yet? Met	64% of our students (n=14) scored a 51 or higher on Section I of the MFT and the average score for those students was 54, meaning both benchmarks were met this portion of the MFT. See attachment for Bio Objective 1: Direct - External Testing - Major Field Test - Section: III for full results		
Direct - External Testing	Has the criterion Major Field Test - Section: II Benchmark = Average score of 53 or higher on section, with 60% of students scoring a 51 or higher. been met yet? Not met	Only 54% of our students (n=14) scored a 51 or higher on Section II of the MFT meaning the benchmark was not met for this portion of the MFT. However, the average score for those students was 53, meaning that benchmark was met for this portion of the MFT. See attachment for Bio Objective 1: Direct - External Testing - Major Field Test - Section: III for full results		

BIO.3 Diversity in structures, functions, and systems: Demonstrate and model, through reductionist and holistic approaches, the interconnectedness of life along a continuum from molecular structures to interactions among organisms and with ecosystems.

Assessment Measures

BIO 124				
Assessment Measure	**Criterion**	**Summary**	**Attachments of the Assessments**	**Improvement Narratives**
Direct - Final Exam	Has the criterion Questions from the lecture Final Exam (BIO124) that were relevant to objective 3 were selected for assessment. The benchmark is 70% of the students at Proficient or better. Proficient is defined as 70% or better on the assessed questions. been met yet? Not met	Only 67% of the students (n=34) scored 70% or better on the six questions assessed	BIO_124_OBJ_3.xlsx	- Revise Assignment for Assessment: Near end of the course have a quiz that explicitly addresses this Objective Current benchmark will be maintained

SPR				
Assessment Measure	**Criterion**	**Summary**	**Attachments of the Assessments**	**Improvement Narratives**
Direct - Interview	Has the criterion Students are asked a question regarding some aspect of Molecular structure in which they must answer based on the knowledge they have gained through various Biology Courses. Benchmark: Average score for all students in the major 3/5 or higher been met yet? Met	The students (n=19) averaged a score of 3.37 (scale 1-5) on this interview question Data is attached to results of Direct Interview Question on Student Performance day for Objective 1		- Revise Program Benchmark: Revise to have 70% of students scoring a 3.5/5 or better on question
Direct - External Testing	Has the criterion Major Field Test - Section: I Benchmark = Average score of 53 or higher on section, with 60% of students scoring a 51 or higher. been met yet? Met	64% of our students (n=14) scored a 51 or higher on Section I of the MFT and the average score for those students was 54, meaning both benchmarks were met this portion of the MFT. See attachment for Bio Objective 1: Direct - External Testing - Major Field Test - Section: III for full results		
Direct - External Testing	Has the criterion Major Field Test - Section: II Benchmark = Average score of 53 or higher on section, with 60% of students scoring a 51 or higher. been met yet?	Only 54% of our students (n=14) scored a 51 or higher on Section II of the MFT meaning the benchmark was not met for this portion of the MFT. However, the average score for those students was 53, meaning this benchmark was met this portion of the MFT. See attachment for Bio Objective 1: Direct - External Testing - Major Field Test - Section: III for full results		
Direct - External Testing	Has the criterion Major Field Test - Section: III Benchmark = Average	86% of our students (n=14) scored a 51 or higher on Section I of the MFT and the average		

	score of 53 or higher on section, with 60% of students scoring a 46 or higher. been met yet?	score for those students was 53, meaning both benchmarks were met this portion of the MFT. See attachment for Bio Objective 1: Direct - External Testing - Major Field Test - Section: III for full results		

BIO.4 Information and Energy: Demonstrate knowledge of major conserved metabolic, signaling, heritable, and molecular processes of all life on Earth.

Assessment Measures

BIO 231				
Assessment Measure	**Criterion**	**Summary**	**Attachments of the Assessments**	**Improvement Narratives**
	Has the criterion Questions from the lecture Final Exam (BIO231) that were relevant to objective 4 were selected for assessment. The benchmark is 70% of the students at Proficient or better. Proficient is defined as 60% or better on the assessed questions. been met yet? Met	74% of the students were proficient or better (n = 19).	Assesment_Data.xlsx	

SPR				
Assessment Measure	**Criterion**	**Summary**	**Attachments of the Assessments**	**Improvement Narratives**
Direct - External Testing	Has the criterion Major Field Test - Percentile Rank (This scores students in all 4 sections of the MFT) Benchmark = 50% of students scoring in the 50th percentile or higher. been met yet? Met	64% of our BS students (n=14) scored in the 50th percentile or above on the full Major Field-test	SUBSCORES_and_PERCENTILES_from_MFT_for_Seniors.docx	

Assessment Findings for the Assessment Measure level for Biology BS: PreMed Concentration

BIO Pre-Med.5 Construct a competitive candidacy for admission to undergraduate medical studies: integrating a strong academic record, proof of observation of medical practice, and identification of other medical school specific admission factors that the individual student must meet.

Assessment Measures

BIO 450				
Assessment Measure	**Criterion**	**Summary**	**Attachments of the Assessments**	**Improvement Narratives**
Direct - Interview	Has the criterion 75% or greater of the student interview responses will be satisfactory or better. been met yet? Met	92% of our students (n=13) had satisfactory or better Mock Interview with the Biology faculty	BIO_450_01_FUL__ _Biology_Practicum_ __Mock_Faculty_Interviews.pdf	- Refine Assessment Tool: Generate a rubric regarding the expectations of a "satisfactory" interview to allow for better assessment.
Direct - Class Assignment	Has the criterion 100% of students produce a professional CV or Resume been met yet? Met	100% of our students (n=13) produced a professional quality CV or Resume	BIO_450_01_FUL__ _Biology_Practicum_ __Final_CV_Resume.pdf	

SPR				
Assessment Measure	**Criterion**	**Summary**	**Attachments of the Assessments**	**Improvement Narratives**
Indirect - Survey of Students	Has the criterion 60% of students actively participating in shadowing or other volunteer roles that will make them competitive for jobs in the medical and human healthcare related jobs and professional programs. been met yet? Met	71% of our Pre-med students (n=7) actively participated in shadowing, volunteering, or a employment in the medical or human health area. For assessment, a student was considered to be actively participating in shadowing if that participated in shadowing either during the summer of 2017 or during the 2017-2018 academic year. Summer 2018 will be assessed next year due to the fact at the time of Student Performance Days our students were stilling waiting to hear about internships and REU, as well as still working on finalizing shadowing experiences.	Shadowing_Experiences_Summer_2017_and_17_18_Academic_Year.pdf	- Refine Assessment Tool: Use VIA to generate a survey and to collect data for our students regarding their shadowing experiences

Assessment Findings for the Assessment Measure level for Biology BS: PreVet Concentration(Imported)

BIO Pre-Vet.5 Construct a competitive candidacy for admission to undergraduate Veterinary medical programs integrating a strong academic record, proof of observation of veterinary practices in two or more areas of the veterinary animal categories, and identification of other vetrinary school specific admission factors that the individual student must meet.

Assessment Measures

BIO 450				
Assessment Measure	**Criterion**	**Summary**	**Attachments of the Assessments**	**Improvement Narratives**
Direct - Interview	Has the criterion 75% or greater of the student interview responses will be satisfactory or better. been met yet? Met	92% of the students (n=13) had a satisfactory or better mock interview with faculty Evidence of data is attached to Direct Interview in BIO450 under PreMed Concentration - Objective 5		- : Generate a rubric of the expectations of a "satisfactory" interview to allow for better assessment
Direct - Class Assignment	Has the criterion 100% of students produce a professional CV. been met yet? Met	100% of the students (n=13) produced a professional quality CV or Resume Evidence of data is attached to Direct - Class Assignment in BIO450 under PreMed Concentration - Objective 5		

SPR				
Assessment Measure	**Criterion**	**Summary**	**Attachments of the Assessments**	**Improvement Narratives**
Indirect - Survey of Students	Has the criterion 60% of students actively participating in shadowing veterinarians and/or volunteering in other animal care avenues to make them competitive for applying to veterinarian schools. been met yet? Met	91% of our PreVet students (n=11) actively participated in shadowing a Veterinarian or worked at a Vet Clinic. For assessment, a student was considered to be actively participating in shadowing if that participated in shadowing either during the summer of 2017 or during the 2017-2018 academic year. Summer 2018 will be assessed next year due to the fact at the time of Student Performance Days our students were stilling waiting to hear about		- Refine Assessment Tool: Use VIA to generate a survey and to collect data for our students regarding their shadowing experiences

		internships and REU, as well as still working on finalizing shadowing experiences. Evidence of data is attached to Indirect - Survey of Students under Student Performance Days in the PreMed Concentration - Objective 5		

Analysis of the Assessment Process

Describe your assessment process; clearly articulate how the program is using course work and or assessment day activities for program assessment. Note any changes that occurred to that process since the previous year. Discuss what activities were successful at assessment and which ones were not as helpful and why. Please include who met to discuss the changes (unless you are a program of one person) and when you met. – Include a discussion on the process for collection and analysis of program data.

This report was compiled by the three biology faculty, Dr. Kimberly L. Keller, Dr. Robin Hirsch-Jacobson, and Dr. Sarah Greenland-White.

There were a few areas in which our majors did not meet the benchmark for certain Objectives, and summaries and improvement narratives are discussed under each assessment field with this report. To summarize, the two main areas in which our students fell short of the benchmark were: (1) 60% of the students scoring a 51 or higher in in Section 2 of the Major Field Test and (2) 70% of the students at Proficient or better on Final Exam questions, where proficient is defined as 70% or better on the assessed questions.

The Major Field Test (MFT) is given to our graduating seniors during Student Performance Days in February. We have struggled in past years with the amount of effort our students give for this exam; however, we do not feel this was the case this year and our students this year were engaged and as a whole, performed well on the exam. We feel the scores closely reflect the type and level of work the faculty have seen from these students in the classroom. All of the benchmarks for the objectives were “Met” except for one. The 60% of the students scoring a 51 or higher in in Section 2 of the MFT was “Not Met” by our B.S. students; however, this is not much of a concern because for that same section of the MFT these students “Met” the benchmark of average score for the cohort of 53. In addition, the benchmark of 50% of students scoring at the 50th percentile rank or higher (Objective 4) was also “Met” for this student cohort, While we will have discussions to determine how to best use the MFT to truly assess student knowledge and the effectiveness of the program; we feel the size of this cohort allows for accurate measuring of the program. While this is normally the case for the B.S. program, it is not always the case for B.A. program and supports combining our assessment reports to allow the largest sample size and get a truer assessment of the program. As described below, we have started collecting data that in the near future will allow us to assess “knowledge added” assessment by determining “value added” to their score on the MFT using entry and exit MFT scores of our Biology Majors.

This is the second year we have had our incoming Biology Majors take the MFT; however, this is the first year we had them take the exam literally as they are entering the Biology program. All incoming Biology Majors took the MFT during the second week of classes in the fall semester in BIO115, the laboratory associated with BIO114. As the data are for collection purposes only at this point, there is no benchmark attached to the scores for our “freshman.” Our long-term assessment plan for the program will occur when these same students take the MFT as an outgoing senior and then we will be able use the scores on the two exams to determine “value added” of each graduating student in the Biology program at William Woods University. The Biology faculty are excited about adding this new level of assessment of our seniors. These data could show that while an outgoing senior may not meet the benchmarks of the MFT when comparing it to the national scores (our current assessment), the same student may have an improvement in their score, showing the program was successful as there would be a definite “value added” assessment.

While our B.S. cohort “Met” the benchmark for the Direct Student Interview for both Objective 1 and Objective 3, we debate every year whether a low score for a question for any given student is due to lack of knowledge in the subject or if it is due to poor interview skills and the stress of answering in front of all three biology faculty. Due to this problem, we have come up with a two-fold solution. First, we plan to change the benchmark, currently we believe the benchmark will be 70% of the students scoring 3.5 or better on the question. We also feel it is hard to distinguish if the low score for a

question is due to lack of knowledge or due to poor interview skills and the stress of answering in front of all three biology faculty. The second change to this part of assessment will be to change from a Direct Interview format to a Direct Quiz format, in order to allow students to more completely answer each question. The only problem we have is this interview was also a time to 'check-in" with students and talk with them about things outside their course to make them successful. We will have further discussions about the importance of that component and if it feasible to do both a Direct Quiz and a Direct Interview during Student Performance Review Days.

We feel the failure to meet the benchmarks for the final exam questions in BIO124 and BIO401 was partially due to looking for questions on the exams that fit the objective instead of writing specific questions on the exam to meet the objective. This is actually a fault of all the Biology faculty and not unique to the faculty teaching those courses, and is something we as biology faculty are addressing for the upcoming assessment year. Our current new plan for assessment in courses is to have a Direct Quiz toward the end of the semester in which the questions are specifically designed around the objectives. As we have now completed our second assessment cycle with the new objectives, we feel we now have a better understanding of which courses and what type of data needs to be collected for each of these new objectives in order for our students to "met and/or surpass" the benchmarks next academic year. Changes in questions and benchmark reviews will occur next fall prior to the collection of data.

The addition of Dr. Sarah Greenland-White to the department has brought new knowledge and enthusiasm to the department. Weekly department meetings with all three Biology faculty took place throughout the academic year to discuss assessment and to communicate the types of data/questions we need to use for assessment purposes. As a department as a whole, we need to plan better for assessments occurring in our individual courses. Current discussions during the generation of this report is that we may begin to assess at least one of our objectives (possibly Objective 3) using the required Field courses and now that we have a full-time faculty teaching the required Anatomy & Physiology courses, we may want to consider assessing those as well. A comprehensive review of our Curriculum and Assessment maps will occur prior to the fall 2018 semester to make some possible changes to ensure everyone is satisfied with their respective course-specific components of the assessment of the program.

For a professions-oriented mission statement, we are satisfied with current preparation of our students, especially when you look at where our students are matriculating following graduation. Therefore, we feel only minor changes in our assessment are needed to accurately measure success of the Biology Program. We do feel strongly that writing one Assessment Report and combining the B.A. and B.S. students would be a much truer assessment of the Biology program as a whole.

Improvement Narrative List

Assessment Findings for the Assessment Measure level

<table>
<tr><td>Standard/Outcome</td><td>BIO.1 Evolution: Articulate knowledge that life evolved over time via mechanisms of mutation, natural selection, and genetic drift, and that there is concrete evidence for this fundamental concept _ evolution from common ancestry _ in the unity of numerous biological processes among species.</td></tr>
<tr><td>Legend</td><td>A</td></tr>
<tr><td>Course/Event</td><td>BIO 124</td></tr>
<tr><td>Assessment Measure</td><td>Direct - Final Exam</td></tr>
<tr><td>Assessment Findings</td><td>Met</td></tr>
<tr><td>Improvement Narrative</td><td>
<table>
<tr><th>Improvement Type</th><th>Summary</th></tr>
<tr><td>Curriculum Revision</td><td>Remove assessing this objective from BIO124 as this Objective is already assessed twice, BIO401 (Evolution) and the Major Field Test.</td></tr>
</table>
</td></tr>
</table>

Standard/Outcome	BIO.3 Diversity in structures, functions, and systems: Demonstrate and model, through reductionist and holistic approaches, the interconnectedness of life along a continuum from molecular structures to interactions among organisms and with ecosystems.
Legend	A
Course/Event	BIO 124
Assessment Measure	Direct - Final Exam
Assessment Findings	Not met
Improvement Narrative	**Improvement Type** / **Summary** Revise Assignment for Assessment / Near end of the course have a quiz that explicitly addresses this Objective Current benchmark will be maintained

Standard/Outcome	BIO.1 Evolution: Articulate knowledge that life evolved over time via mechanisms of mutation, natural selection, and genetic drift, and that there is concrete evidence for this fundamental concept _ evolution from common ancestry _ in the unity of numerous biological processes among species.
Legend	A
Course/Event	BIO 401
Assessment Measure	Direct - Final Exam
Assessment Findings	Not met
Improvement Narrative	**Improvement Type** / **Summary** Revise Assignment for Assessment / Near end of the course have a quiz that explicitly addresses this Objective Current benchmark will be maintained

Standard/Outcome	BIO.1 Evolution: Articulate knowledge that life evolved over time via mechanisms of mutation, natural selection, and genetic drift, and that there is concrete evidence for this fundamental concept _ evolution from common ancestry _ in the unity of numerous biological processes among species.
Legend	A
Course/Event	Student Performance Review
Assessment Measure	Direct - Interview
Assessment Findings	Met
Improvement Narrative	**Improvement Type** / **Summary**

	Revise Program Benchmark: Revise to have 70% of students scoring a 3.5/5 or better on the question Refine Assessment Tool: Move this from a Direct Interview format to a more Direct Quiz/Exam based assessment using VIA

Standard/Outcome	BIO.3 Diversity in structures, functions, and systems: Demonstrate and model, through reductionist and holistic approaches, the interconnectedness of life along a continuum from molecular structures to interactions among organisms and with ecosystems.
Legend	A
Course/Event	Student Performance Review
Assessment Measure	Direct - Interview
Assessment Findings	Met
Improvement Narrative	**Improvement Type**: Revise Program Benchmark — **Summary**: Revise to have 70% of students scoring a 3.5/5 or better on question

Standard/Outcome	BIO Pre-Med.5 Construct a competitive candidacy for admission to undergraduate medical studies: integrating a strong academic record, proof of observation of medical practice, and identification of other medical school specific admission factors that the individual student must meet.
Legend	A
Course/Event	BIO 450
Assessment Measure	Direct - Interview
Assessment Findings	Met
Improvement Narrative	**Improvement Type**: Refine Assessment Tool — **Summary**: Generate a rubric regarding the expectations of a "satisfactory" interview to allow for better assessment.

Standard/Outcome	BIO Pre-Med.5 Construct a competitive candidacy for admission to undergraduate medical studies: integrating a strong academic record, proof of observation of medical practice, and identification of other medical school specific admission factors that the individual student must meet.
Legend	A
Course/Event	Student Performance Review

Assessment Measure	Indirect - Survey of Students
Assessment Findings	Met
Improvement Narrative	**Improvement Type**: Refine Assessment Tool **Summary**: Use VIA to generate a survey and to collect data for our students regarding their shadowing experiences

Standard/Outcome	BIO Pre-Vet.5 Construct a competitive candidacy for admission to undergraduate Veterinary medical programs integrating a strong academic record, proof of observation of veterinary practices in two or more areas of the veterinary animal categories, and identification of other vetrinary school specific admission factors that the individual student must meet.
Legend	A
Course/Event	BIO 450
Assessment Measure	Direct - Interview
Assessment Findings	Met
Improvement Narrative	**Improvement Type**: **Summary**: Generate a rubric of the expectations of a "satisfactory" interview to allow for better assessment

Standard/Outcome	BIO Pre-Vet.5 Construct a competitive candidacy for admission to undergraduate Veterinary medical programs integrating a strong academic record, proof of observation of veterinary practices in two or more areas of the veterinary animal categories, and identification of other vetrinary school specific admission factors that the individual student must meet.
Legend	A
Course/Event	Student Performance Review
Assessment Measure	Indirect - Survey of Students
Assessment Findings	Met
Improvement Narrative	**Improvement Type**: Refine Assessment Tool **Summary**: Use VIA to generate a survey and to collect data for our students regarding their shadowing experiences

Program Activities

Student Performance Review

Describe the department assessment day activities if not already described previously. Please articulate the nature of the assessments are conducted, explain the process for assessment that happens on these two days. Include the schedule of assessment day for your program. What does the data and outcomes tell you? What changes will you make as a result of the data? What areas are successful for the program?

We use Student Performance Days to have our senior students take the Major Field Test (MFT) in Biology. Our BS senior cohort, which is Pre-Med and Pre-Vet concentration, included 14 students this year and this senior group surpassed all of the benchmarks from the MFT assessment except the one of the two benchmarks associated with Section II of the MFT.

This academic year, we were able to administer the MFT to the incoming class of Biology Majors in the fall by doing it the second week of classes in the fall semester in BIO115, the laboratory associated with BIO114. This change was made in order to truly capture the entry level knowledge base of each of our incoming students majoring in Biology. In a few years, this data will be use to add another level of assessment of our program, we will be able to determine the amount of "value added" from participation in our Biology program. This will be a valuable assessment in addition to our current use of the MFT to evaluate the knowledge of our exiting seniors compared to other Biology majors on a national level. As this data is being used solely to generate an entry level baseline, there is no benchmark for this data at this time; however, the results of the MFT for those students is being placed here as evidence the data was collected, even though it occurred in the fall of 2017 and will not officially be utilized for a few years.

With the moving of the testing of incoming students to the fall, our incoming students Student Performance Day activities involved three separate 30 minute Breakout Sessions, one for each of our Biology Degree Programs. All incoming Biology students were required to attend Breakout Sessions specific to their degree in Biology in which requirements of their Major were discussed, as well as a Question & Answer session about their major, jobs, and other related issues.

This year our Biology BS students did very well on the Direct Student Interview Questions portion and we were very pleased that these students surpassed the benchmark for both Objective 1 and Objective 3. In previous years, for each Objective, we gave two questions and allowed students a choice as to which one they would answer. This year, in order to assess students on a more equal level, we only had one question per objective for students to answer, thus eliminating any question bias. We are considering making changes to this part of the Student Performance Day and to change from an interview format to a more formal testing process utilizing VIA to collect data. The questions will then be individually assessed by all Biology Faculty and an average score per question obtained. We feel we may get better answers per question if we have students type out their answers. Right now it is hard to assess whether their lack of an appropriate answer is due to their lack of knowledge obtained from their classes or whether their poor answers are due to being nervous about answering questions in an interview format in front of all three Biology Faculty.

Part of the Individual Interviews also involves questions inquiring what the students are doing "outside of their coursework" to make them competitive in the next stage of their career. We feel this is an important time to check in with our majors and learn about what their plans are for the summer. It provides an opportunity to stress the importance of shadowing, volunteering, and getting internships in order to be successful at the next stage of their careers. Since we also plan to collect the shadowing data using VIA as well for easier data collection for assessment, we will need to consider if it is feasible to maintain some type of interview to check in with students about their progress in obtaining the appropriate shadowing, volunteering, and internships to make them competitive.

Every year during Student Performance Days we bring in a Speaker who gives research-based talk to the entire department. We feel it is extremely valuable for our students to witness such talks and we attempt to alternate the area of research presented each year in order to expose our students to the variety of sub-disciplines within Biology during their 4-years here at William Woods. Our students continually provide positive feedback about the speakers and it is common to hear them discussing the talk amongst themselves for the next several days. We plan to continue this as part of our student performance days. This year we held a Meet & Greet/Question & Answer reception after the seminar for students to interact with the speaker, and that was well attend and successful. Therefore, it is definitely something we will continue to incorporate that into our Student Performance Day schedule.

Overall, we are very pleased with our Student Performance Days and feel we have a schedule that allows us to assess our students in a variety of manners, and the small changes mentioned above will only serve to better our assessment efforts of the Biology program.

Student Performance Review Schedule
Upload the program schedule for students during Performance Reviews.
Student_Performance_Days_Schedule___Spring_2018.pdf
Freshman_Fall_Biology_MFT_Departmental_Roster_with_Section_Subscores.pdf

Senior Showcase
Describe program Senior Showcase activities if not detailed previously in the report? What benefit does the program gain from the activities? What if any assessment of students happens during this event? What changes if any will occur due to what is learned by faculty on Senior Showcase?

We had 13 of our 14 biology students presented a poster at the Senior Showcase on Thursday, April 19, 2018

Assessment Rubrics
Upload rubrics used for Senior Showcase or Student Performance Reviews for student assessment.

Service Learning
Does the Program include projects/ course content that uses the philosophy of service learning?
Yes
No (selected)

Service Learning Component
If so, how is service learning infused in the coursework within your department? Is service or community engagement in the program mission? Describe the Service Learning Activities that your students and department engaged in this past year. How did the activities improve student learning? How did the activities benefit the community?

N/A

LEAD Events
Highlight lead events sponsored by program faculty that are connected to program or general education objectives for the past academic year. Include a total number of lead events program faculty sponsored.

Robin Hirsch-Jacobson - **Conservation Within Our Zoos** - Learn about the efforts and actions that zoos are taking to help improve the lives of animals across the world through various conservation and wildlife projects. Also, hear direct accounts from individuals who interned at the St. Louis Zoo while also gaining knowledge on different animal species around the world. Monday, April 16, 2018

Kimberly L. Keller - Senior Showcase - Poster Presentations by Biology Majors - Senior Biology students completing their capstone course will present a scientific conference type poster on a topic of their choice for Senior Showcase. Students attending this event will complete a reflection form on the students/posters they visit to receive LEAD credit. The poster presentations will be given continuously throughout the scheduled event. Eighteen posters will be on display in Burton 104 and Burton 105 for students to review. April 19, 2018

Kimberly L. Keller - Parasitic Resistance in Horses - W**hat is it and does it exist in any of the horses at William Woods University.** Dr. Kimberly L. Keller, Assistant Professor of Biology, will present the results of her Cox Distinguished Professorship in Science Research which involved surveying the equine herd population for parasites. If any of the horses tested positive for parasites, attempts were made to determine if that parasite had acquired any resistance to the deworming medicines used here on campus at William Woods University. Come and hear Dr. Keller talk about her research and the results of this study. April 25, 2018

Student Accomplishments
Highlight special examples of student successes in the field (academic: mentor-mentee, conference presentations, competitive internship, journal acceptance; extra-curricular: horse show championship, art exhibit). This is for any accomplishments that a student achieved outside of course work or the normal expectations of student success.

Clark Cox Distinguished Professor in Science Research Project (2017 – 2018 academic year) **Title: Prevalence of Resistance in Microorganisms Testing the Presence of Resistance Genes in Oral Microbiomes and Equine Parasites.** This Cox Research Project is divided into two separate projects.

• **Lance Leverenz** – Research involves testing for the presence of tetracycline resistance genes (tetA and tetR) in the Oral Microbiomes of William Wood University students. The research involves isolating gDNA from salvia samples of students and then using PCR techniques to determine the presence of the tetA and tetR genes.

• **Rebecca Smith and Emily Tichy** – Research involves performing fecal eggs counts on the ~150 horses from William Woods an then perform two week rechecks on any horse that tested positive and was treated with deworming medications. The goal is to attempt identify any horses on campus that appear to be infested with Strongyle resistance parasites. Once resistance parasites are identified, we will attempt to grow those parasites and further test their resistance.

Phil Kulpinski (Fall 2017 - Current) Research is a collaborative effort with the City of Fulton to help collect data about organic pollutants using the GC/MS and to test for Escherichia coli contamination in a waterway, Stinson Creek, which runs through the city. Stinson Creek has been classified as an impaired (that is, pollution-damaged) waterway d by the Missouri Depart of Natural Resources to have issues. Stinson Creek's classification as an impaired (that is, pollution-damaged) waterway by the Department of Natural Resources.

Current Students - Summer 2017 Successes - Presentations at the Fall 2017 Biology Retreat and 4-year planning session

Rachael Barker - Context and reasoning: The resistance to "resistance" - Department of Biological Sciences, North Dakota State University, Collaborations in Discipline-based Education Research (CIDER), Research experience for Undergrauates (REU).

Megan Wilson - St Louis Zoo Internship Working with African Ungulates - St. Louis, MO

Phil Kulpinski - What is a CNA (Certified Nursing Assistant)? Insights and benefits of working as a CNA at the Fulton Manor. Fulton, MO

December 2017 and April 2018 Gradute Accomplishments:

Ava Demanes	Accelerated BSN at Goldfarb, St. Louis MO
Nic Keithley	University of Missouri - Masters of Health Administration (Accredited)
Gabby Kleinow	Accelerated BSN Goldfarb, St. Louis MO
Lance Leverenz	Missouri State University – Doctoral of Physical Therapy

Alumni/Previous Graduates

Maddie McMahill (May 17) is now working as a laboraotry technician at The Great Plains Laboratory, Inc. in Kansas City, MO

Lainie (Alaina) Buff (May 17) is working as a laboraotry technician at Biogen in Raleigh, NC

Faculty Accomplishments
Highlight special examples of faculty success in the profession/field/content area. This is for any accomplishment of a faculty activity/research/professional nature.

Kimberly L. Keller - Clark Cox Distinguished Professor in Science Research Project (2017 – 2018 academic year) Title: Prevalence of Resistance in Microorganisms Testing the Presence of Resistance Genes in Oral Microbiomes and Equine Parasites.

Assessment Rubric

Annual Assessment Rubric — 13.000 pts 86.67%

	3.000 Assessment Reflects Best Practices	2.000 Assessment Meets the Expectations of the University	1.000 Assessment Needs Development	0.000 Assessment is Inadequate	N/A
Learning Objectives weight: 1.000	• Detailed, measurable program learning objectives • Objectives are shared with students and faculty	• Measurable program learning objectives. • Learning objectives are available to students.	• Program learning objectives are identified and are generally measurable	• Program learning objectives are not clear or measurable	N/A
Comment:					
Assessment Measures weight: 1.000	• Multiple measures are used to assess a student-learning objectives. • Rubrics or guides are used for the measures. • All measurements are clearly described. • External evaluation of student learning included.	• Assessment measures relate to program learning objectives. • Various measures are used to assess student learning. • Measures chosen provide useful information about student learning.	• Assessment focuses on class content only. • Minimal description of how the assessment relates to the objective. • Minimal assessment measures established.	• Assessment measures not connected to objectives. • Assessment measures are not clear. • No assessment measures are established.	N/A
Comment:					
Assessment Results weight: 1.000	• All objectives are assessed annually, or a rotation schedule is provided. • Data are collected and analyzed to show learning over time. • Standards for performance and gaps in student learning are clearly identified.	• Most objectives assessed annually. • Data collected and analyzed showing an annual snapshot of student learning. • Data are used to highlight gaps in student learning. • Some data from non-course based content.	• Data collected for at least one program objective. • Data collection is incomplete. • Gaps in student learning not identified. • Lacking external data to support course data.	• Learning objectives are not routinely assessed. • Routine data is not collected. • No discussion on gaps in student learning. • No use of external data to support student learning. • Assessment data not yet collected.	N/A
Comment:	Great points discussed in the analysis of the data provided within the program. The MFT with the incoming students being administered at the beginning of the term will give you a truer picture of the incoming student knowledge base to provide for a more accurate "knowledge added" score on the Senior evaluation.				
Faculty Analysis and Conclusions weight: 1.000	• Data is shared that incorporates multiple faculty from the program. • Discussions on data results incorporate multiple faculty. • Opportunities for adjunct faculty to participate. • Includes input from external sources when possible.	• Multiple program faculty receive assessment results. • Assessment results are discussed • Specific conclusions about student learning are made based on the available assessment results.	• Minimal faculty input about results is sought • Data not used to determine success or not to the objective. • Minimal conclusions made.	• Faculty input is not sought. • Conclusions about student learning are not identified. • N/A Program recently started or too few graduates to suggest any changes.	N/A
Comment:					
Actions to Improve Learning and Assessment weight: 1.000	• All assessment methods, timetable for assessing, and evaluating the effectiveness modifications are included. • Changes to assessment are inclusive of multiple faculty. • Description of changes is detailed and and linked to assessment results.	• More than one change to assessment is proposed, timetable for assessment, and evaluating the change is provided. • Changes to assessment measures is highlighted. • Changes are realistic, with a good probability of improving learning or assessment.	• At least one change to improve learning or assessment is identified. • The proposed action(s) relates to faculty conclusions about areas for improvement. • Adjustments to the assessment are proposed but not clearly connected to data	• Lacking actions to improve student learning. • Actions discussed lack supportive data. • Lacking discussion of the effectiveness of the assessment plan	N/A
Comment:					