



WILLIAM WOODS
UNIVERSITY

Biology BS Annual Assessment 2022-2023

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Annual Assessment 2022-2023

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)

| | Student Minors | Student Majors |
|-----------|----------------|----------------|
| 2021-2022 | 42 | 62 |
| 2022-2023 | | |

Online
Hybrid

Concentrations 2022-2023

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

Concentrations 2021-2022

If your program contains concentrations, please list the concentrations and the number of students identified with each concentration.

Pre-Med Preparation - 19 students*

Pre-Vet Preparation - 24 students*

*There is a discrepancy between the total number of concentrations (24 PreMed and 19 PreVet) resulting in 43 majors, yet the number of declared B.S. majors being 42. For several years now there is a discrepancy between the number of declared Biology BS Majors and the number listed in the BS Concentrations.

Due to the fact that the Nursing Program never got fully approved and is no longer being sought as a potential major offered at William Woods, the Pre-Nursing Concentration was finally been removed as a possible concentration under the Biology BS.

Student Demographics

What are the program goals for student retention, persistence, and degree completion? What do the persistence numbers mean to the faculty in the program? Are the persistence numbers what the program expected? If not, how could the

numbers improve?

The Biology 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. By our program goal mentioned above, we would expect a graduation rate ~60%.

Our department's approach to the 75% retention is through multiple factors:

- As much interaction with the full-time biology faculty as possible through the freshman Biology Core courses (lecture and lab)
- Easy access to the not only the Biology Faculty, but those teaching Chemistry, Math, and Physics
- Having an event sponsored by the department in early fall to help them generate a 4-year degree plan
- Specifically planned interactions with upper class majors
- Involvement in Clubs

Optimal Enrollment

Considering current human and physical resources, what is the optimal enrollment for the program?

60

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

Admissions and Marketing Materials

Reflect on the current marketing materials used for the program. Please attach screen shots of the website or any material you are referencing in this section. What changes, if any, should be made to the material? Are there recommendations on how to modify the current material?

The Biology faculty have not met without anyone in Admission and/or Marketing in roughly 2 years.

Marketing Material

Program Assessment

Standard/Outcome

| Identifier | Description |
|------------|--|
| WWU2021.1 | Knowledge and Scholarship: Demonstrate current knowledge and educational expertise in an academic or professional discipline engaging students in the process of academic discovery. |

Additional Standards/Outcomes

| Identifier | Description |
|---------------|---|
| BIO 2019.4 | Information and Energy: Demonstrate knowledge of major conserved metabolic, signaling, heritable, and molecular processes of all life on Earth. |
| 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. |
| 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. |

Alignment to the University Objectives

Please discuss the Program alignment to the University Objectives. Specific evidence is not to be uploaded, but discussion is expected of the assignment, and intentionality of how the objective is met with program curriculum.

WWU2016.1 Major Field Competence: Students will demonstrate excellence in an academic or professional discipline, and engage in the process of academic discovery.

Students are strongly encouraged to get shadowing hours and/or internships, as well as relevant professional jobs as well, during the school year, but primarily over the breaks. This is accomplished through formal and informal advising. The faculty all help with this process, as well as have classes specific to enable them to prepare for their future career (i.e. BIO 450).

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.

Much of our curriculum includes writing scientific papers, which has an ethical culture to itself. Students learn how to appropriately use other people's work, while giving them credit, and not plagiarizing. Additionally we do lots of group-work in and outside of the labs and classes that ensure our students develop the skills to respectfully and successfully work with others.

WWU2016.3 Self-Liberation: Students will develop an honest understanding and appreciation of themselves and others resulting in an ability to make individual decisions.

Though we help students get and find internships, shadowing hours, and professional work, we do not hold their hand. They must do much of the work themselves, knowing they have us as support. This allows them to safely, and autonomously, make important career and life decisions, building their self-confidence and awareness that they can do it.

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.

Our program has a strong push towards intellectual curiosity and continual learning that goes beyond information that should be learned for a test. From ethics discussions and having interesting speakers from a variety of biology backgrounds that our students are strongly encouraged to attend, to the self-designed experiments that are required in many of the biology courses (all biology students will have at least three major self-designed projects, many will have six) students have lots of opportunities to see how biology fits into the broader world. This preparation prepares our students to participate in the global society with an understanding that biology is relevant in today's world and impacts choices and policies. Furthermore, by experiencing a broad range of biological topics and having experiencing researching topics for themselves, students will be better able to understand how they can find information out for themselves and will have the tools needed to pursuing continual learning even after they graduate.

General Education Alignment to Program

How do the General Education criteria align with Program Objectives? What courses within the program build upon skills learned from general education courses (please list the program course and the general education criteria)? The General Education clusters are attached to the document below.

Critical Analysis: (9 credit hours) – Students apply logical and analytical reasoning skills to diverse source materials in the interest of discerning and debating aesthetic, thematic, and ethical content.

In all biology coursework, students are expected to integrate sound logical arguments with the scientific method. Students are expected to analyze and interpret general textbooks, primary scientific literature, and data. Throughout biology courses, students are expected to articulate the ethical interface of scientific practice and general societal issues, as well demonstrate integrity in their own scientific communications (oral and written).

Creative Expression: (12 credit hours) – Students develop the ability to express ideas and concepts, both logically and creatively, through written, oral, reflective, and aesthetic practices utilizing various media forms.

In all biology coursework, students are expected to demonstrate creative and independent generation of ideas based upon scientific parameters that they are presented, e.g. independently generating novel hypotheses regarding specific issues that they might be given. Students are expected to prepare and perform presentations on content-specific topics, in addition to extensive written technical papers and essays.

Quantitative Inquiry: (10 credit hours) – Students will develop and practice quantitative problem-solving skills in order to analyze and critically evaluate information in a larger context.

Quantitative inquiry is the foundation of the entire biology program. In all biology coursework students are expected to analyze data, evaluate it critically, and to be able to generate and interpret statistics. Math courses provide students with the quantitative background to perform these activities.

Society & the Individual: (12 credit hours) – Students integrate knowledge to articulate an understanding of diverse cultures, historical contexts, and human behaviors.

In all biology coursework students are expected to apply their knowledge of human behavior in the context of molecular to organismal processes (e.g. how the human body works and thinks) in addition to the formation of new scientific ideas.

Students are expected to be able to articulate that there are variable correct interpretations of authoritative scientific principles and demonstrate competency with the historical development of scientific principles – that the natural process of scientific development involves building upon the ideas of scientific progenitors.

GE_Cluster_Descriptions_FINAL_Version_Approved.docx

Program Alignment to NSSE Objectives

Faculty discussed the most recent NSSE results in spring of 2022 and identified universal objectives for all academic content. Please articulate what the program is doing to further students' knowledge and skills in the following areas: 1C- Explained course material to one or more students; 2E - Tried to better understand someone else's view by imagining how an issues looks from his/her perspective; 4C-Analyzing an idea, experience, or line of reasoning in depth by examining its parts; 4D- Evaluating a point of view, decision, or information source. Please describe the activities used and the impact on student learning.

Our program integrated the three NSSE objectives into individual courses at the discretion of the professor. Illustrative examples of these integrative activities and their assessments are included below. The Biology Faculty will have a discussion prior to the start of the Fall 2021 semester to determine if addressing these NSSE objectives will be best served by continuing to address these individually, or if a program-wide approach to these objectives would better meet the needs of the students.

1) integrate more interdisciplinary work within the curriculum

In Dr. Keller's Microbiology class (BIO303/304), our students learn about the "One Health Initiative" through a collaborative lab with Dr. Paul Schiltz and the Equestrian Department learning to do fecal Egg counts on samples from the University equine herd. The interdisciplinary work was exciting to the students who got to see how biology knowledge translates into health initiatives. Dr. Keller's Molecular Biotechnology (BIO414/415) also worked with Dr. Schiltz on a Platlet-Rich Plasma protocol comparison and our students also attempted to identify a antibiotic bacteria from wound on one of the horses that would not heal.

2) to connect learning to societal problems or issues

All of our biology classes connect with societal problems or issues—these range from environmental and conservation issues (Conservation BIO3XX & Ecology BIO 330/331) to human medical and ethical challenges (strongly addressed in Genetics BIO231/232, Microbiology BIO303/304, Human Anatomy and Physiology I and II BIO314/315 & BIO324/325, Human Path. Physiology BIO3XX, and Molecular Biotechnology BIO414/415).

While many of these issues are addressed as the naturally arise from the material being learned (e.g. the ethical implications of altering DNA, the role of antibiotic overuse contributing to “superbugs”, the interactions of species on each others' survival) we did seek to explicitly connect learning to societal problems or issues.

3) to examine the strengths and weaknesses of their (students) own views on a topic or issue

All of the upper-level biology classes, and many of the lower-level ones, (BIO 114/115, BIO 124/125) include a research paper or project. These projects and/or papers are assessed part-way through the course, giving the students feedback on the strength of their mastery and understanding of the topic as well as providing them information about their weaknesses in the area. This method allows students to build on their strengths and address their weaknesses prior to completing their final projects.

This feedback is given by the instructor.

A new activity that directly examined students' own views on topics was done in Human Anatomy and Physiology II lab (BIO 324). The students had a whole lab period where they were given a list of anatomical misconceptions, and were required to find at least one that they thought was true, and figure out why it wasn't. Similarly, they needed to explain away at least one misconception that a lab-mate had, as well as explain the reason that certain misconceptions are so prevalent. This was assessed as a lab assignment and was successful as it had students evaluate their own assumptions and investigate the strengths and weaknesses of their ideas. In the future, we anticipate using this direct method of “examine the ideas you have and explain the common errors that are made in this area” could be a valuable teaching method in numerous biology courses.

Curriculum Map

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

Bachelor of Science - Core Assessment

| | BIO 114 | BIO 115 | BIO 124 | BIO 231 | BIO 310 | BIO 330 | BIO 401 | BIO 450 | CHM 114 | CHM 124 | CHM 314 | PHY 201 | PHY 212 | SPR |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----|
| BIO 2019.4 Information and Energy: Demonstrate knowledge of major conserved metabolic, signaling, heritable, and molecular processes of all life on Earth. | I | A | R | A, R | | | R | | | | | | | 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. | I | A | R | R | R | R | A, M | | | | | | | A |
| BIO.2 Interdisciplinary: Demonstrate that fundamental principles and laws of chemistry and physics are also underpinnings that govern complex living systems. | I, A | A | R | R | R | R | R | | I | R | 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. | I | A | A, R | R | R | R | M | | I | R | R | | | A |

Biology BS: PreMed Concentration

| | BIO 313 | BIO 317 | CHM 324 | CHM 440 | MAT 124 | MAT 214 | MAT 304 | BIO 450 | SPR |
|---|---------|---------|---------|---------|---------|---------|---------|---------|-----|
| BIO 2019.4 Information and Energy: Demonstrate knowledge of major conserved metabolic, signaling, heritable, and molecular processes of all life on Earth. | R | R | M | M | R | R | R | | |
| 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 | | | | | |

Biology BS: PreVet Concentration

| | BIO 303 | CHM 324 | CHM 440 | MAT 124 | MAT 304 | EQU 111 | EQU 117 | EQS 306 | EQS 376 | EQS 404 | BIO 450 | SPR |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----|
| BIO 2019.4 Information and Energy: Demonstrate knowledge of major conserved metabolic, signaling, heritable, and molecular processes of all life on Earth. | R | R, M | M | R | R | | | R | R | R | | |
| 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 | R | R | R | R | R | I | I | R | R | M | A, M | A |

| | | | | | | | | | | | | |
|---|---|------|---|---|---|--|--|---|---|---|--|--|
| school specific admission factors that the individual student must meet. | | | | | | | | | | | | |
| 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 | 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 | 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 | M | M | | |

Changes to Curriculum

Are there any changes made to the curriculum map for this academic year? If so, please describe the program changes made along with the rationale for why and the impact the change should have on student learning?

Slight changes were made to the curriculum map to align the curriculum map to our current concentration checklists; however, none of the changes to the curriculum map affected the Assessment Map.

Biology Faculty will have a discussion before the start of the Fall 2021 semester about Assessment and to determine if any of our required upper division courses should be used for Assessment.

Assessment Findings

Assessment Findings for the Assessment Measure level for Bachelor of Science - Core Assessment

| 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. | | | | |
| Assessment Measures | | | | |
| BIO 115 | | | | |
| Assessment Measure | Criterion | Summary | Attachments of the Assessments | Improvement Narratives |
| Direct - External Testing | Has the criterion Major Field Test - Section: III There is no score Benchmark = this test is given to our incoming Biology majors to determine the baseline for each student for the exam. Biology Majors will retake the Major Field Test exam as exiting seniors and scores will be compared in order to determine "knowledge gained" from completion of the program. Benchmark = 100% of the declared Biology Majors will take the exam (those declared at the time of test administration). been met yet? Met | Benchmark was Met. At the time of test administration as 100% of the declared Biology Majors took the MFT. (n=26) | | |
| Direct - External Testing | Has the criterion Major Field Test - Section: IV There is no score Benchmark = this test is given to our incoming Biology majors to determine the baseline for each student for the exam. Biology Majors will retake the Major Field Test exam as exiting seniors and scores will be compared in order to determine "knowledge gained" from completion of the program. Benchmark = 100% of the declared Biology Majors will take the exam (those declared at the time of test administration). been met yet? Met | Benchmark was Met. At the time of test administration as 100% of the declared Biology Majors took the MFT. (n=26) | | |
| BIO 401 | | | | |
| Assessment Measure | Criterion | Summary | Attachments of the Assessments | Improvement Narratives |
| Direct - Quiz/Exam | Has the criterion An assessment specific quiz (BIO401) will be used to ensure that assessment questions are direct and relevant to objective 1. The benchmark is 70% of the students at Proficient | Benchmark was Met as 77% of the students were proficient or better (n = 13) | | |

| | | | | |
|-----------------------------------|---|--|---------------------------------------|--|
| | or better. Proficient is defined as 70% or better on the assessed questions. been met yet? Met | | | |
| Student Performance Review | | | | |
| Assessment Measure | Criterion | Summary | Attachments of the Assessments | Improvement Narratives |
| 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? Not met | The average score of 53 was not met as the average was 44; however, 60% of the students scored a 46 or better (N=10) | | - Revise Program Benchmark: Look at data for past several years and determine if new benchmark is needed |
| 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? Not met | The average score of 53 was not met as the average was 51; however, 70% of the students scored a 46 or better (N=10) | | - Revise Program Benchmark: Look at data for past several years and determine if new benchmark is needed |

| | | | | |
|---|---|---|---------------------------------------|-------------------------------|
| Standard/Outcome | | | | |
| 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 - Quiz/Exam | Has the criterion Questions from the First Lecture Exam (BIO114) that were relevant to objective 2 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 | Benchmark was Met as 78% of the students were proficient or better (n = 63) | BIO114_Quiz_Results.docx | |

| BIO 115 | | | | |
|---------------------------|--|---|---------------------------------------|-------------------------------|
| Assessment Measure | Criterion | Summary | Attachments of the Assessments | Improvement Narratives |
| Direct - External Testing | Has the criterion Biology Major Field Test - Section: I There is no score Benchmark = this test is given to our incoming Biology majors to determine the baseline for each student for the exam. Biology Majors will retake the Major Field Test exam as exiting seniors and scores will be compared in order to determine "knowledge gained" from completion of the program. Benchmark = 100% of the declared Biology Majors will take the exam (those declared at the time of test administration). been met yet? Met | Benchmark was Met. At the time of test administration as 100% of the declared Biology Majors took the MFT. (n=26) | | |
| Direct - External Testing | Has the criterion Major Field Test - Section: II There is no score Benchmark = this test is given to our incoming Biology majors to determine the baseline for each student for the exam. Biology Majors will retake the Major Field Test exam as exiting seniors and scores will be compared in order to determine "knowledge gained" from completion of the program. Benchmark = 100% of the declared Biology Majors will take the exam (those declared at the time of test administration). been met yet? Met | Benchmark was Met. At the time of test administration as 100% of the declared Biology Majors took the MFT. (n=26) | | |

| Student Performance Review | | | | |
|-----------------------------------|--|---|---------------------------------------|--|
| Assessment Measure | Criterion | Summary | Attachments of the Assessments | Improvements 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? Not met | The average score of 53 or higher was not met as the average was 44 and only 40% of the students scored a 46 or better (N=10) | | - Revise Program Benchmark: Look at data for past several years and determine if new benchmark is needed |
| 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 | The average score of 53 or higher was not met as the average was 49 and only 20% of the students scored a 46 or better (N=10) | | - Revise Program Benchmark: Look at data for past several years and determine if new benchmark is needed |

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.

Assessment Measures

| BIO 115 | | | | |
|---------------------------|--|---|--------------------------------|------------------------|
| Assessment Measure | Criterion | Summary | Attachments of the Assessments | Improvement Narratives |
| Direct - External Testing | Has the criterion Biology Major Field Test - Section: I There is no score Benchmark = this test is given to our incoming Biology majors to determine the baseline for each student for the exam. Biology Majors will retake the Major Field Test exam as exiting seniors and scores will be compared in order to determine "knowledge gained" from completion of the program. Benchmark = 100% of the declared Biology Majors will take the exam (those declared at the time of test administration). been met yet? Met | Benchmark was Met. At the time of test administration as 100% of the declared Biology Majors took the MFT. (n=26) | | |
| Direct - External Testing | Has the criterion Biology Major Field Test - Section: II There is no score Benchmark = this test is given to our incoming Biology majors to determine the baseline for each student for the exam. Biology Majors will retake the Major Field Test exam as exiting seniors and scores will be compared in order to determine "knowledge gained" from completion of the program. Benchmark = 100% of the declared Biology Majors will take the exam (those declared at the time of test administration). been met yet? Met | Benchmark was Met. At the time of test administration as 100% of the declared Biology Majors took the MFT. (n=26) | | |
| Direct - External Testing | Has the criterion Biology Major Field Test - Section: III There is no score Benchmark = this test is given to our incoming Biology majors to determine the baseline for each student for the exam. Biology Majors will retake the Major Field Test exam as exiting seniors and scores will be compared in order to determine "knowledge gained" from completion of the program. Benchmark = 100% of the declared Biology Majors will take the exam (those declared at the time of test administration). been met yet? Met | Benchmark was Met. At the time of test administration as 100% of the declared Biology Majors took the MFT. (n=26) | | |

| Assessment Measure | Criterion | Summary | Attachments of the Assessments | Improvement Narratives |
|--------------------|----------------------|-----------------------|--------------------------------|------------------------|
| Direct - | Has the criterion An | Benchmark was Not Met | BIO124_01 Asses | - Revise |

| | | | | |
|-----------|---|---|-----------------|---|
| Quiz/Exam | assessment specific quiz (BIO124) will be used to ensure that assessment questions are direct and relevant to objective 3. 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 | as only 62% of the students received a Proficient (70%) or higher on the Assessment Quiz (n=42) | sment_Data.docx | Assignment for Assessment: Quizzes have been on-line and will be going back to in-class quizzes |
|-----------|---|---|-----------------|---|

| Student Performance Review | 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? Not met | The average score of 53 or higher was not met as the average was 44 and only 40% of the students scored a 46 or better (N=10) | | - Revise Program Benchmark: Look at data for past several years and determine if new benchmark is needed |
| 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 | The average score of 53 or higher was not met as the average was 49 and only 20% of the students scored a 46 or better (N=10) | | - Revise Program Benchmark: Look at data for past several years and determine if new benchmark is needed |
| 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? Not met | The average score of 53 or higher was not met as the average was 44; however, 60% of the students scored a 46 or better (N=10) | | - Revise Program Benchmark: Look at data for past several years and determine if new benchmark is needed |

Standard/Outcome
BIO 2019.4 Information and Energy: Demonstrate knowledge of major conserved metabolic, signaling, heritable, and molecular processes of all life on Earth.

| Assessment Measures | | | | |
|---------------------|-----------|---------|--------------------|------------------------|
| BIO 115 | Criterion | Summary | Attachments of the | Improvement Narratives |
| Assessment Measure | | | | |

| | | | | |
|---------------------------|---|---|--------------------|--|
| | | | Assessments | |
| Direct - External Testing | Has the criterion Major Field Test - Percentile Rank (This scores students in all 4 sections of the MFT) There is no score Benchmark = this test is given to our incoming Biology majors to determine the baseline for each student for the exam. Biology Majors will retake the Major Field Test exam as exiting seniors and scores will be compared in order to determine "knowledge gained" from completion of the program. Benchmark = 100% of the declared Biology Majors will take the exam (those declared at the time of test administration). been met yet? Met | Benchmark was Met. At the time of test administration as 100% of the declared Biology Majors took the MFT. (n=26) | | |

| BIO 231 | | | | |
|---------------------------|--|--|---------------------------------------|-------------------------------|
| Assessment Measure | Criterion | Summary | Attachments of the Assessments | Improvement Narratives |
| Direct - External Testing | Has the criterion An assessment specific quiz (BIO231) will be used to ensure that assessment questions are direct and relevant to objective 4. 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 | The benchmark was Met as 87% of the students were proficient by scoring a 70% or better on the assessed questions. (n= 15) | Scores__Genetics_Assessment_Quiz.docx | |

| Assessment Measure | Criterion | Summary | Attachments of the Assessments | Improvement Narratives |
|---------------------------|--|---|---|--|
| Direct - External Testing | Has the criterion Major Field Test - Percentile Rank (This score students in all 4 sections of the MFT) Benchmark = 50% of students scoring in the 50th percentile or higher. been met yet? Not met | As only 30% of the BS Biology Seniors scored in the 50th percentile or higher. (n=10) | 2023_MFT_Data_and_Comparison_for_Knowledge_Gained_REPORT_Version.xlsx | - Revise Program Benchmark: Look at data for past several years and determine if new benchmark is needed |
| Direct - External Testing | Has the criterion Benchmark = 100% of our students will show an increase in their over Percentile Rank when we compare their MFT Percentile Rank as an Incoming Biology Major to their MFT Percentile Rank taken as a graduating Senior been met yet? Met | 100% of the BS Biology Seniors with two MFT scores for comparison showed an increase. (n=9) | | |

| | | | | |
|-------------------------|--|---|--|--|
| Direct - Research Paper | Has the criterion On the day of assessment, students will be emailed a peer-reviewed journal research article in the field of Molecular Structure. On Assessment Day, students will be asked to analyze the article by answering questions about the article and data. Students will have a minimum of two hours to complete the assignment. Benchmark: 70% of students scoring 70% or higher on the article analysis questions. been met yet? | Met as 86% of the students scored a 70% or higher on the analysis questions. (n=14) | Tweener_Student_Article_Review_Scores_for_AIS_Report.pdf | |
|-------------------------|--|---|--|--|

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

| | | | | |
|--|--|---|---------------------------------------|-------------------------------|
| 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. | | | | |
| 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 | Benchmark was Met as 83% of the student scored a satisfactory score or better on their faculty Mock Interview (N=6) | | |
| Direct - Class Assignment | Has the criterion 100% of students produce a professional CV or Resume been met yet? Met | Benchmark was Met as 100% of the students produced a professional CV or Resume (N=6) | | |
| Student Performance Review | | | | |
| 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? Not met | Only 35% of BS BIO PreMed students participated in some kind shadowing experience (n=20) | | |
|-------------------------------|--|--|--|--|

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

| 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 veterinary 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 | Benchmark was Met as 100% of the student scored a satisfactory score or better on their faculty Mock Interview (N=3) | | |
| Direct - Class Assignment | Has the criterion 100% of students produce a professional CV. been met yet? Met | Benchmark was Met as 100% of the of students produce a professional CV (N=3) | | |
| Student Performance Review | | | | |
| 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 | Feel just short of benchmark, as only 58% of BS BIO PreVet Students participated in | | |

| | | | | |
|--|---|--|--|--|
| | animal care avenues to make them competitive for applying to veterinarian schools. been met yet? Not met | some kind of shadowing that summer or during the academic year. (n=31) | | |
|--|---|--|--|--|

Analysis of the Assessment Process

Describe your assessment process; clearly articulate how the program uses coursework and or Student Performance Review for program wide assessment. Note any changes that occurred to the process since the previous year. Discuss what activities were successful 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.

For the Biology Program Assessment, we use a mixture of Biology courses in our Core Curriculum, the ETS Biology Major Field Test, Scientific Journal Analysis, and Surveys to assess our Biology students. The Biology Faculty are overall quite satisfied with how we assess the Curriculum, and besides a few minor changes to curriculum and/or Benchmark adjustments, we plan to make no change to our overall assessment plan.

We consider our four core Biology Courses to be BIO114/115 & BIO124/125 (Biology for Majors I & II), BIO231/232 (Genetics), and BIO401 (Evolution). BIO114, BIO124, and BIO231 are the first three Biology courses every Biology major (BA or BS) is required to take and then BIO401 is our required Senior capstone course. All four courses use either a Biology Objective specific quiz or exam questions to assess the students in the course. Three of the four course assessments were met this academic year; where only BIO124 did not meet the 70% of students scoring a 70% or higher on the assessment questions. The last couple years of quizzes questions were taken online; however, the assessment quiz was taken in person. Dr. Hirsch-Jacobson has decided all quizzes will be given in person for the next year to reinforce the concepts for longer-term retention.

During the Student Performance Review (SPR) day, our Seniors take the ETS Biology Major Field Test which allows us to compare the knowledge base of our seniors compared to the other students nationally. For the BS program, only 30% of the students did not meet scoring in the 50th percentile or higher (n=10). In addition, nine of our graduating students also took the exam as an incoming Freshman, so we were able to assess the “knowledge-gained” from the program. While our students did not meet several of the benchmarks that we had set in terms of the Average for a section subscore and a certain % of the students obtaining a certain section score as a Senior, we did see significant increases in “knowledge-gained” from the program. In terms of “knowledge-gained”, 100% of the BS Seniors had an increase in their Percentile Rank from their Freshman; but 70 % of these students had a % change of >147%. (n=9, as we did not have Freshman data for 1 of our BS seniors). In the four sections subscores, 100% of our BS Seniors showed an overall increase in the average of their four section subscores from their Freshman to Senior year. Unfortunately, only 56% of the students had an increase in all 4 of the section subscores, with 78% increasing their score in three of the four subsections. Overall, the increase in scores from their Freshman to Senior year on a standardized exam, the Biology faculty feel our Biology curriculum is strong and students are able to increase their “knowledge gained” quite significantly.

For Sections I – Cell Biology and Section II – Molecular Biology and Genetics, the benchmarks for the average score and the student’s individual subscores were not met. This result is bit alarming, as the majority of BS seniors plan to apply and go to professional and graduate program based in the health profession (PreMed and PreVet). In fact, in Section I the 22% of the BS students scored lower than they did as freshman. For Section III – Organismal Biology and Section IV – Population Biology, Evolution and Ecology, the average score of the cohort was not met and only 44% scored a 51 or higher in Section IV. Only second part of benchmark for Section III was met as 67% scored 46 or higher (n=9). Overall, while the scores of the BS Seniors mostly showed improvement from their freshman year, compared to other Biology students nationally, our students did not meet several of our benchmarks. Therefore, the Biology faculty need to look at several years of data and possibly re-adjust our benchmarks.

As the Assessment for the Concentration Objective, the BS students are assessed on if they have an up-to-date Resume/CV, and receive an overall score of 3/5 or higher on a Mock interview with Faculty. For this 100% made a

Resume/CV in BIO450 and 83% scored a 3 or higher on their Mock Interview (n=12) – which was 100% for PreVet (n=3) and 83% for PreMed students.

It is important for students entering health-based careers to shadow to understand the day-to-day expectations for that profession. Of our PreVet majors, only 58% of them had shadowing experience either the Summer of 2022 or during the academic year (n=31), which is below our expected 60%. The 58% was only obtained by including the senior PreVet shadowing experiences raised the percentage 10%. For our PreMed students, only 35% of the PreMed majors had shadowing experience either over the Summer of 2022 or during the 22–23 academic year (n=20). While Human Health Professional and Graduate programs encourage shadowing, most do not have specific shadowing requirements like the Veterinary Schools do. But shadowing is a great for students to determine if that career is a good fit for them. The Biology faculty will continue to stress the importance of shadowing to both our PreMed and PreVet majors.

The Biology faculty attempt to meet weekly throughout the semester, and we will use one of our first meetings in the fall of 2023 to look at our MFT data from the last three to four years and make adjustments to the Benchmark in regards to all four sections and the overall percentile rank as we feel is needed. But as mentioned above, Biology faculty feel we have a strong and competitive curriculum and our students increase their “knowledge gained” scores quite significantly. In addition, the Biology faculty share responsibility in terms of collecting course data, rotating the Research assignment for our Tweeners, and getting a Speaker to give a Research talk at SPR days. The Biology faculty truly work as a cohesive unit to provide support to all of our Biology majors, enthusiastically teach our areas of expertise, and all want our Biology Majors to be successful – and we feel the results in this Assessment Report speak to the fact we are creating an environment conducive to learning.

Improvement Narrative List

Assessment Findings for the Assessment Measure level

| | |
|---|--|
| 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 - Quiz/Exam |
| Assessment Findings | Not met |
| Improvement Narrative | |
| Improvement Type | Summary |
| Revise Assignment for Assessment | Quizzes have been on-line and will be going back to in-class quizzes |

| | |
|--|----------------------------|
| Standard/Outcome BIO 2019.4 Information and Energy: Demonstrate knowledge of major conserved metabolic, signaling, heritable, and molecular processes of all life on Earth. | |
| Legend | A |
| Course/Event | Student Performance Review |
| Assessment Measure | Direct - External Testing |
| Assessment Findings | Not met |
| Improvement Narrative | |

| Improvement Type | Summary |
|--------------------------|--|
| Revise Program Benchmark | Look at data for past several years and determine if new benchmark is needed |

| 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 - External Testing | | | | |
| Assessment Findings | Not met | | | | |
| Improvement Narrative | | | | | |
| <table border="1"> <thead> <tr> <th>Improvement Type</th> <th>Summary</th> </tr> </thead> <tbody> <tr> <td>Revise Program Benchmark</td> <td>Look at data for past several years and determine if new benchmark is needed</td> </tr> </tbody> </table> | | Improvement Type | Summary | Revise Program Benchmark | Look at data for past several years and determine if new benchmark is needed |
| Improvement Type | Summary | | | | |
| Revise Program Benchmark | Look at data for past several years and determine if new benchmark is needed | | | | |

| 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 - External Testing | | | | |
| Assessment Findings | Not met | | | | |
| Improvement Narrative | | | | | |
| <table border="1"> <thead> <tr> <th>Improvement Type</th> <th>Summary</th> </tr> </thead> <tbody> <tr> <td>Revise Program Benchmark</td> <td>Look at data for past several years and determine if new benchmark is needed</td> </tr> </tbody> </table> | | Improvement Type | Summary | Revise Program Benchmark | Look at data for past several years and determine if new benchmark is needed |
| Improvement Type | Summary | | | | |
| Revise Program Benchmark | Look at data for past several years and determine if new benchmark is needed | | | | |

| Standard/Outcome | |
|---|----------------------------|
| BIO.2 Interdisciplinary: Demonstrate that fundamental principles and laws of chemistry and physics are also underpinnings that govern complex living systems. | |
| Legend | A |
| Course/Event | Student Performance Review |
| Assessment Measure | Direct - External Testing |
| Assessment Findings | Not met |
| Improvement Narrative | |

| Improvement Type | Summary |
|--------------------------|--|
| Revise Program Benchmark | Look at data for past several years and determine if new benchmark is needed |

Standard/Outcome

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

| | |
|---------------------|----------------------------|
| Legend | A |
| Course/Event | Student Performance Review |
| Assessment Measure | Direct - External Testing |
| Assessment Findings | Not met |

Improvement Narrative

| Improvement Type | Summary |
|--------------------------|--|
| Revise Program Benchmark | Look at data for past several years and determine if new benchmark is needed |

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 - External Testing |
| Assessment Findings | Not met |

Improvement Narrative

| Improvement Type | Summary |
|--------------------------|--|
| Revise Program Benchmark | Look at data for past several years and determine if new benchmark is needed |

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 - External Testing |

| | |
|--------------------------|--|
| Assessment Findings | Not met |
| Improvement Narrative | |
| Improvement Type | Summary |
| Revise Program Benchmark | Look at data for past several years and determine if new benchmark is needed |

| | |
|---|--|
| 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 - External Testing |
| Assessment Findings | Not met |
| Improvement Narrative | |
| Improvement Type | Summary |
| Revise Program Benchmark | Look at data for past several years and determine if new benchmark is needed |

Program Activities

Student Performance Review

Describe the department Student Performance Review activities if not already articulated. Please describe the nature of the assessments conducted as well as the process of assessment happening 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?

Student Performance Review (SPR) day was a single day as the other is being used for a full day of Senior projects the "Symposium on Research, Scholarship, and Creativity. Our Student Performance Schedule include the following events: (1) Biology MFT for our Graduating Seniors, (2) Figure Analysis of Research Article for our second- and third-year Biology Majors ("tweeners"), (3) a survey of students self-reporting their Shadowing experiences (Summer 2022, Winter Break, plan for Summer 2023), as well as a survey our Graduating Senior students, (4) a Research Talk followed by a Meet & Greet Session, and (5) an "Impartation of Wisdom" luncheon with our new/incoming majors and our graduating seniors.

We always use the SPR Days to have our senior students take the Major Field Test (MFT) in Biology. Fourteen Biology Seniors (4 BA and 10 BS Majors) took the MFT in February. The Biology Faculty are considering changing some of our benchmark from the "average score" to the median score" to help eliminate some of the issues when a single student in the cohort does poorly on the MFT.

This academic year, we were again 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.

Of our 14 Biology graduating senior students who took the MFT this February, 13 also took the MFT their first year in the program (9/10 BS students and 4/4 BA students). For those nine students, we were able to determine "knowledge gained"

while attending WWU. This is the second academic year of a large amount of entering MFT data and exiting MFT data of our seniors, therefore our current Benchmark is only 100% of the students will show a gain in knowledge between the two exams - and we achieved that benchmark. After three to four years of data, the biology faculty will determine what Benchmarks we want to use for this “knowledge-gained” portion of our assessment. This data 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. Since the data generated in BIO115 is being used simply as an entry-level baseline there is no specific benchmark for the scores on this exam, “Met” simply implies all students declared as majors at that time took the MFT.

The second- and third-year Biology Majors (“tweeners”) students are required to complete a Data Analysis Assessment activity. This is the third year using a Data Analysis Assessment activity, and the Biology Faculty **again** redesigned this portion of the University’s Student Performance Review. This year we provided our students with a single, peer-reviewed journal article. These students were given two hours and asked to read that journal articles and answer the subset of specific questions regarding the figures and the data for each article. The faculty wrote questions for the article. This change will provide us the ability to truly assess each student’s ability to read, comprehend, and analyze data and to be able to assess each student on a more equal level. This assessment activity was currently assessed in Objective 3; however, we feel it is better to move the assessment to Objective 5 in order to widen the content area of the journal articles we can use for this assessment. We know we need to refine our assessment tools to help ensure our students are assessed on a more individual level.

This is the second year we decided to have everyone except our graduating students (first – third years) complete a short survey self-reporting focusing on their Shadowing experiences for the previous summer (Summer 2022), the Academic Year/Winter Break, and plans they are working on for Summer (2023). For graduating students, we had a separate survey regarding their Shadowing experiences for the previous summer (Summer 2022) and the Academic Year/Winter Break. This survey focused more on what degree/career path they started with and what degree/career path they are as they graduate. In addition, we tried to gain some insight into their future plans.

Every year during Student Performance Days we bring a speaker who gives research-based talk to the entire department and all of our Biology Majors. Fortunately, we were able to hold the research talk in person in the Library Auditorium on campus. The Speaker was John George, a Wildlife Biologist at Missouri Department of Conservation. With a talk about “Conservation and Restoration in Missouri.” The faculty were excited about the amount of questions and engagement by our students and we were able to hold an in-person Meet & Greet/Question & Answer reception after the seminar for students to interact with the speaker. 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. Therefore, this event is definitely something we will continue to incorporate that into our Student Performance Day schedule.

Our “Impartation of Wisdom” lunch event for just our new/incoming students and our outgoing graduating seniors was successful. The Biology Faculty gave the “new” students a set of questions as a conversation starter and we definitely feel this helped make it a very successful event as you could hear the buzz of conversation down the hall. While this event is not necessary for any assessment, however, this is definitely important in the retention of our students and we will definitely have this event each year.

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.

Biology_Department_SPR_Day_Schedule___Spring_2023.pdf

Senior Showcase/Symposium

Describe program activities used to highlight Senior achievement. What benefit does the program gain from the activities? What if any assessment of students happens during this event?

The primary activity that showcases student achievement is that our graduating seniors present a poster during the Symposium for Research, Scholarship, and Creativity. They do most of the work on their poster during BIO 450, Biology Practicum, the previous Spring semester. This year, however, a subset of the students put additional hours of their own time into conducting original research. I believe this was a significant improvement, and moving forward this will be required of our seniors.

The program gains several benefits from this activity.

- Students get to experience a poster session. This is a multidisciplinary event with around 80 posters and is also a LEAD event. The atmosphere is fantastic for our students.
- Students design and present their poster giving them the ability to learn how to communicate science from start to finish.
- They present to other students and faculty, so they must be able to answer a range of questions from basic to complex.

The assessment is done in conjunction with BIO 450, Biology Practicum, and BIO 401, Evolution. BIO 450 assesses their poster to about midway for those who do their own research whereas BIO 401 assesses how their finished product looks, and how well they presented it. Starting next year, BIO 401 will also need to assess the quality of their independent research, data collection, and data analysis. We had 13 Biology Majors present this year.

Tools used for Assessment

Upload rubrics or other Assessment based tools used by the program that are important to the assessment process.

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?

Co-Curricular and LEAD Events

Describe Co-Curricular and LEAD events sponsored by program faculty. This includes LEAD and other events meant to engage students and foster learning outside of the classroom.

Dr, Sarah Greenland-White held 3 LEAD events:

Thursday, November 17, 2022 12:00:00 PM - "By Hand": A History of Chiropractic Medicine - Doctors of Chiropractic (DC) are holistic physicians that utilize manual therapies to address pain and dysfunction. This presentation by Zach Becker of Logan University will discuss the history of the profession and explore its future.

Saturday, November 19, 2022 6:30:00 PM - Conservation Trivia - Come join conservation club for a fun trivia night before finals and test your knowledge about conservation Prizes will be given to 1st, 2nd, and 3rd placed winners.

Monday, February 20, 2023 12:00:00 PM - Pharmacy Careers: A Prescription for Success - Professor Tricia Berry of St. Louis College of Pharmacy will speak on pharmacy careers. She will present about pharmacy as a profession, as well as the program available through St. Louis College of Pharmacy.

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 accomplishment a student achieved outside of course work or the normal expectation of student success.

Alumni Accomplishments

Please highlight special examples of any successes of recently graduated alumni (acceptance or graduation graduate school, employment or professional milestones).

Faculty Accomplishments

Highlight special examples of faculty success in the profession/field/content area. This is for any accomplishment of a faculty member that is research or professional in nature.

Dr. Kimberly L. Keller and Dr. Robin Hirsch-Jacobson were both promoted to the Rank of Professor.

Assessment Rubric:

| Clear | 3.00 Exceeds | 2.00 Meets | 1.00 Falls Below Expectations | N/A |
|--|---|---|--|----------|
| Mission Statement Clearly Articulated weight: 1.000 | ✓ The mission statement for the program is insightful and forward thinking. It aligns with the University Mission and learning objectives showing a clear alignment between the University and the program. | ✓ The mission statement for the program clearly articulated and aligned with the University mission. | ✓ The mission statement is minimal at best. | ✓ N/A |
| Comment: | | | | |
| Reflection on Student Demographics, Retention, and Degree Completion Data weight: 1.000 | ✓ The program provides a detailed description on the enrollment, retention, persistence and degree completion numbers. The program provides new ideas on how to improve retention of their program students or articulates what they are currently doing to keep students in their program. | ✓ The program provides a basic reflection on enrollment, retention, persistence, and degree completion data provided. | ✓ The program does not reflect on enrollment, retention, persistence, and degree completion data in a detailed way. | ✓ N/A |
| Comment: | | | | |
| Marketing Materials weight: 1.000 | ✓ The program outlines the successes and needs in regards to marketing. Detailed suggestions on how to market the program and what niche areas that are program specific would benefit the marketing strategy. | ✓ The program discussed the general marketing strategy for the program. | ✓ The program provided little to no discussion on the marketing materials or approach to how to market the program. | ✓ N/A |
| Comment: | | | | |
| Alignment to University Objectives weight: 1.000 | ✓ The program provides a detailed explanation of how program courses align to the Institutional Objectives. This explanation details specific courses, or activities that coordinate with the intent of the Institutional Objectives. | ✓ The program provides a basic explanation of how program courses align to the Institutional Objectives. This explanation provides a minimal understanding of how the program is aligned to the Institutional Objectives. | ✓ The program provides little to no explanation of how program courses align to the Institutional Objectives. | ✓ N/A |
| Comment: | | | | |
| General Education alignment clearly explained weight: 1.000 | ✓ The program provides a detailed explanation of the General Education criteria and how the basic skills learned are expanded upon in the program. Details include but are not limited to: specific courses, or activities that stretch the knowledge of the specific areas. | ✓ The program provides a basic explanation of the General Education curriculum and how the skills learned are expanded in program courses. | ✓ The program provides a minimal explanation of the General Education curriculum and how the skills learned are expanded in program courses. | ✓ N/A |
| Comment: | | | | |
| NSSE Objectives weight: 1.000 | ✓ The program provided a detailed listing of activities and assessments used within the program that focused on the identified NSSE objectives. The activities and assessments were divided out within the curriculum and impacted different cohort groups. | ✓ The program provided a basic explanation of the activities and assessments used within the program that focused on the identified NSSE objectives. | ✓ The program provided minimal explanation of the activities and assessments used within the program that focused on the identified NSSE objectives. | ✓ N/A |
| Comment: | | | | |
| Curriculum Map alignment and changes weight: 1.000 | ✓ The curriculum map is detailed and complete. All Changes made to the curriculum map are detailed with supporting rationale for the decision.. | ✓ The curriculum map is complete. Changes made to the curriculum map are explained with some explanation as to why the changes were implemented. | ✓ The curriculum map is not complete and little to no explanation on curricular changes was provided. | ✓ N/A |
| Comment: | no notification if the curriculum map is the same or changed from the previous year. | | | |
| Assessment Map weight: 1.000 | ✓ Assessment of objectives are spread out across the curriculum with a variety of assessment measures and each program objective is assessed a minimum of twice a year. | ✓ Each objective is assessed a minimum of 2 times a year or an assessment rotation is explained so that all objectives are assessed. The assessments are not concentrated in one class. | ✓ The assessment map is not complete or much of the assessment happens in only one course. Not all objectives are assessed annually, nor is a plan provided on assessment. | ✓ N/A |
| Comment: | | | | |

| | | | | |
|--|---|---|---|-------|
| Data Driven Decision-making is explained weight: 1.000 | ✓ An overview of program assessment is provided with details on the specific successes and challenges from the year. A detailed review of how assessment was administered over the academic year is clearly outlined. | ✓ A basic overview of program assessment is provided with some details on the successes and challenges from the year. A basic review of how assessment was administered over the academic year is outlined. | ✓ A basic overview of program assessment is not provided with little to no discussion on the administration of assessment over the academic year. | ✓ N/A |
| Comment: | <input type="text"/> | | | |
| Documentation provided on assessment findings weight: 1.000 | ✓ The program uploads all rubric and support information to support the claims in the assessment findings along with detailed instructions on the assessment process and data analysis. | ✓ The program uploads all rubric and support information to support the claims in assessment findings. | ✓ The program did not upload the data to support assessment claims in the assessment findings. | ✓ N/A |
| Comment: | <input type="text"/> | | | |
| Analysis of Assessment weight: 1.000 | ✓ The program completed assessment findings for each component identified, and provided a comprehensive summary of each assessment measure identified in the report. | ✓ The program completed the assessment findings for each component and provided a summary for each assessment measure. | ✓ The program did not provide a completed assessment findings for each component, nor did they complete the summary for each measure. | ✓ N/A |
| Comment: | <input type="text"/> | | | |
| Improvement narratives are selected with intentionality weight: 1.000 | ✓ The program identified Improvement Narratives that appear to move the program forward and see the bigger picture than only the specific program curriculum options | ✓ The program used the provided Improvement Narratives and selected options that made sense to the objectives and issues within the assessment. | ✓ The program did not use any improvement narratives, or the ones chosen are not aligned with assessment results. | ✓ N/A |
| Comment: | <input type="text"/> | | | |
| Student Performance Review weight: 1.000 | ✓ The program described and provided a detailed account of Student performance Review activities. Data evidence provided and detailed. | ✓ The program provided the schedule and a brief description of Student Performance Review with data of the results. | ✓ The program did not provide complete explanation on Student Performance Review nor did they provide data results. | ✓ N/A |
| Comment: | <input type="text"/> | | | |
| Senior Showcase weight: 1.000 | ✓ The program had all senior students participate in Senior Showcase and provided a detailed explanation of their expectation and the presentations presented. | ✓ The program described the Senior showcase activities and provided some evidence of what was presented. | ✓ Little to no content of Senior showcase was provided. | ✓ N/A |
| Comment: | <input type="text"/> | | | |
| Co Curricular and LEAD activities weight: 1.000 | ✓ The program detailed the activities of LEAD and other co-curricular programming that was provided throughout the year. They provided numerous events for students. | ✓ The program provided a listing of LEAD events and activities provided. | ✓ The program provided little to no description of the Co-curricular activities provided throughout the year. | ✓ N/A |
| Comment: | <input type="text"/> | | | |
| Faculty, alumni, and Student accomplishments weight: 1.000 | ✓ The program provided detail updates on successes on Students, Alumni and Faculty with added information explaining the kinds of success that were experienced. | ✓ The program provided a listing of information on Students, Alumni, and faculty accomplishments. | ✓ The program provided little to no data on students, alumni, faculty accomplishments. | ✓ N/A |
| Comment: | <input type="text"/> | | | |

Appendix: Supplemental Data

BIO124 Biology for Majors II – Spring 2023 Assessment results

BIO124 01

| Student | Score (%) |
|---------|-----------|
| A | 100 |
| B | 100 |
| C | 80 |
| D | 40 |
| E | 80 |
| F | 100 |
| G | 60 |
| H | 80 |
| I | 80 |
| J | 80 |
| K | 40 |
| L | 100 |
| M | 80 |
| N | 60 |
| O | 60 |
| P | 40 |
| Q | 80 |
| R | 100 |
| S | 80 |
| T | 60 |
| U | 60 |
| V | 80 |
| W | 80 |
| X | 80 |
| Y | 80 |
| Z | 60 |

MET 17 of 26

BIO124 02

| Student | Score (%) |
|---------|-----------|
| A | 80 |
| B | 80 |
| C | 80 |
| D | 20 |
| E | 60 |
| F | 100 |
| G | 80 |
| H | 6 |
| I | 80 |
| J | 40 |
| K | 60 |
| L | 40 |
| M | 40 |
| N | 80 |
| O | 80 |
| P | 0 |
| Q | 80 |

MET 9 of 17

Course: NOT MET as only 60% (26 of 43) Scored a 70% or Higher

Biology Department SPR Day – Spring 2023 February 22nd

| Time | Group | Event | Room | Faculty in Charge |
|-------------------|---|---|---------------------------------|---------------------------|
| 10:00am – 12:00pm | Graduating Seniors - Required | Biology Major Field Test | TBD | Dr. Robin Hirsch-Jacobson |
| 10:00 – 2:30pm | ALL Biology Majors - Required | On-line Survey about Shadowing <i>Seniors don't leave MFT until they do it</i> | Online – check email | Dr. Kimberly Keller |
| 10:00am – 12:00pm | 2nd and 3rd years - Required | Journal Article Review/Data Interpretation/ Figure Analysis Bring Laptop Computers | Cox209 | Dr. Kimberly Keller |
| 12:30 – 1:30pm | Graduating Seniors & First -years Required | Impartation of Wisdom Lunch | Cox 300 | Dr. Sarah Greenland-White |
| 1:30 – 2:00pm | First years-Required | Advice I wish someone had told me when I was a 1st year | Cox 300 | Dr. Kimberly Keller |
| 6:00 – 7:00pm | All Biology Majors-Required | John George- Conservation and Restoration in Missouri | Dulany Library Auditorium | Dr. Robin Hirsch-Jacobson |
| 7:00 – 8:00pm | Everybody is invited- Not Required | Meet and Greet with the speaker | COX 300 | Dr. Robin Hirsch-Jacobson |

Graduating Seniors = Graduating Biology majors who are currently enrolled in BIO401 (Evolution)

2nd and 3rd years = Biology students who have completed BIO231/ 2332 (Genetics) but are **NOT** enrolled in BIO401 (Evolution)

First years = Incoming majors whose Biology courses this academic year have been the Biology for Majors I and II series (BIO114/115 & BIO124/125) and these students have **NOT** taken BIO231/232 (Genetics)

Results of Genetics Assessment Quiz – Fall 2022

| Student | Correct out of 20 | Percentage |
|-----------------|-------------------|--------------|
| 1 | 11 | 55 |
| 2 | 14.5 | 72.5 |
| 3 | 14 | 70 |
| 4 | 13 | 65 |
| 5 | 16 | 79 |
| 6 | 17 | 85 |
| 7 | 18 | 90 |
| 8 | 16 | 80 |
| 9 | 17 | 85 |
| 10 | 17.5 | 87.5 |
| 11 | 16 | 80 |
| 12 | 18 | 90 |
| 13 | 18.5 | 92.5 |
| 14 | 17.75 | 89 |
| 15 | 17.5 | 87.5 |
| Averages | 16.12 | 80.53 |
| | | |
| Scores | Number of Scores | Percentage |
| 90 – 100 | 3 | 20% |
| 80 – 89 | 7 | 47% |
| 70 – 79 | 3 | 20% |
| 60 – 69 | 1 | 6.5% |
| 50 – 59 | 1 | 6.5% |
| | | |
| | | |
| | | |
| | | |
| | | |

| Student | Points Missed per question (Each question is worth 5 points) | | | | | | Points Missed | Score out of 30 pts | Percentage |
|-----------------|--|----------|----------|----------|----------|----------|---------------|---------------------|------------|
| | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | | | |
| 1 | 1 | 0 | 0 | 2 | 2 | 0 | 5 | 25 | 83 |
| 2 | 2 | 0 | 1 | 2 | 0 | 1 | 6 | 24 | 80 |
| 3 | 0 | 2 | 2 | 0 | 0 | 0 | 4 | 26 | 87 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 100 |
| 5 | 1 | 0 | 1 | 0 | 0 | 1 | 3 | 27 | 90 |
| 6 | 1 | 0 | 1 | 1 | 0 | 0 | 3 | 27 | 90 |
| 7 | 1 | 1 | 0 | 0 | 0 | 1 | 3 | 27 | 90 |
| 8 | 0 | 3 | 1 | 2 | 0 | 0 | 6 | 24 | 80 |
| 9 | 1 | 3 | 1 | 2 | 0 | 1 | 8 | 22 | 73 |
| 10 | 2 | 2 | 2 | 1 | 0 | 2 | 9 | 21 | 70 |
| 11 | 2 | 0 | 0 | 1 | 0 | 0 | 3 | 27 | 90 |
| 12 | 1 | 3 | 2 | 2 | 0 | 1 | 9 | 21 | 70 |
| 13 | 2 | 1 | 0 | 0 | 5 | 2 | 10 | 20 | 67 |
| 14 | 2 | 2 | 1 | 0 | 2 | 0 | 7 | 23 | 77 |
| 15 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 28 | 93 |
| 16 | 2 | 2 | 1 | 0 | 0 | 2 | 7 | 23 | 77 |
| 17 | 3 | 3 | 3 | 1 | 0 | 1 | 11 | 19 | 63 |
| Average: | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 24 | 81 |

Green = Biology BA Student

Orange = Biology BS Student

2023 Senior Cohort - BS BIO

| | Student Names | Total score (Range is 120-200) | Percentile Scores | | | | Subscore 1: Cell Biology | | | 2: Molecular Biology and Genetics | | | 3: Organismal Biology | | | 4: Population Biology, Evolution, and Ecology | | |
|---|---------------|--------------------------------|---------------------------|-------------------------------|----------------------|----------|--------------------------|------------------------------|----------|-----------------------------------|------------------------------|----------|--------------------------|------------------------------|----------|---|------------------------------|----------|
| | | | Overall 2023 (percentile) | Overall previous (percentile) | Change in Percentile | % change | Raw score Section 1 2023 | Raw score Section 1 previous | % change | Raw score Section 2 2023 | Raw score Section 2 previous | % change | Raw score Section 3 2023 | Raw score Section 3 previous | % change | Raw score Section 4 2023 | Raw score Section 4 previous | % change |
| 1 | | 163 | 79 | 32 | 47 | 147 | 57 | 47 | 21.3 | 60 | 31 | 93.5 | 60 | 48 | 25.0 | 67 | 52 | 28.8 |
| 2 | | 178 | 98 | 82 | 16 | 20 | 70 | 65 | 7.7 | 81 | 55 | 47.3 | 69 | 69 | 0.0 | 77 | 67 | 14.9 |
| 3 | | 136 | 11 | 3 | 8 | 267 | 38 | 27 | 40.7 | 47 | 50 | -6.0 | 29 | 32 | -9.4 | 38 | 20 | 90.0 |
| 4 | | 130 | 4 | 1 | 3 | 300 | 31 | 27 | 14.8 | 47 | 31 | 51.6 | 32 | 35 | -8.6 | 22 | 20 | 10.0 |
| 5 | | 156 | 62 | 8 | 54 | 675 | 54 | 35 | 54.3 | 44 | 38 | 15.8 | 56 | 39 | 43.6 | 63 | 36 | 75.0 |
| 6 | | 147 | 36 | 8 | 28 | 350 | 38 | 27 | 40.7 | 47 | 41 | 14.6 | 48 | 29 | 65.5 | 54 | 48 | 12.5 |
| 7 | | 142 | 23 | 3 | 20 | 667 | 38 | 35 | 8.6 | 38 | 31 | 22.6 | 46 | 32 | 43.8 | 48 | 31 | 54.8 |
| 8 | | 135 | 10 | 7 | 3 | 43 | 23 | 42 | -45.2 | 44 | 23 | 91.3 | 27 | 42 | -35.7 | 50 | 36 | 38.9 |
| 9 | | 142 | 23 | 1 | 22 | 2200 | 35 | 45 | -22.2 | 41 | 31 | 32.3 | 46 | 24 | 91.7 | 48 | 22 | 118.2 |
| | | 148 | 38 | 16 | 22 | 519 | 43 | 39 | 13 | 50 | 37 | 40 | 46 | 39 | 24 | 52 | 37 | 49 |

I

| |
|----|
| 70 |
| 57 |
| 54 |
| 38 |
| 38 |
| 38 |
| 35 |
| 31 |
| 23 |

33%

II

| |
|----|
| 81 |
| 60 |
| 47 |
| 47 |
| 47 |
| 44 |
| 44 |
| 41 |
| 38 |

22%

III

| |
|----|
| 69 |
| 60 |
| 56 |
| 48 |
| 46 |
| 46 |
| 32 |
| 29 |
| 27 |

67%

IV

| |
|----|
| 77 |
| 67 |
| 63 |
| 54 |
| 50 |
| 48 |
| 48 |
| 38 |
| 22 |

44%

148 38 16 22 519 43 39 13 50 37 40 46 39 24 52 37 49

2023 Senior Cohort - BA BIO

| Student Names | Total score (Range is 120-200) | Percentile Scores | | | | Subscore 1: Cell Biology | | | 2: Molecular Biology and Genetics | | | 3: Organismal Biology | | | 4: Population Biology, Evolution, and Ecology | | |
|-----------------|--------------------------------|---------------------------|-------------------------------|----------------------|------------|--------------------------|------------------------------|-----------|-----------------------------------|------------------------------|-----------|--------------------------|------------------------------|-----------|---|------------------------------|-----------|
| | | Overall 2023 (percentile) | Overall previous (percentile) | Change in Percentile | % change | Raw score Section 1 2023 | Raw score Section 1 previous | % change | Raw score Section 2 2023 | Raw score Section 2 previous | % change | Raw score Section 3 2023 | Raw score Section 3 previous | % change | Raw score Section 4 2023 | Raw score Section 4 previous | % change |
| | 162 | 77 | 19 | 58 | 305 | 65 | 48 | 35.4 | 65 | 44 | 47.7 | 56 | 32 | 75.0 | 59 | 48 | 22.9 |
| | 139 | 17 | 8 | 9 | 113 | 38 | 45 | -15.6 | 31 | 38 | -18.4 | 44 | 39 | 12.8 | 45 | 28 | 60.7 |
| | 142 | 23 | 2 | 21 | 1050 | 54 | 35 | 54.3 | 41 | 38 | 7.9 | 42 | 20 | 110.0 | 38 | 36 | 5.6 |
| | 142 | 23 | 2 | 21 | 1050 | 51 | 35 | 45.7 | 41 | 38 | 7.9 | 39 | 24 | 62.5 | 43 | 31 | 38.7 |
| AVERAGES | 151 | 47 | 14 | 34 | 209 | 52 | 47 | 10 | 48 | 41 | 15 | 50 | 36 | 44 | 52 | 38 | 42 |

| | Overall 2023 (percentile) | Overall previous (percentile) | Change in Percentile | % change | I | II | III | IV |
|-----------------|---------------------------|-------------------------------|----------------------|------------|-----------|-----------|-----------|-----------|
| | 77 | 19 | 58 | 1050 | 65 | 65 | 56 | 59 |
| | 23 | 2 | 21 | 1050 | 54 | 41 | 44 | 45 |
| | 23 | 2 | 21 | 305 | 51 | 41 | 42 | 43 |
| | 17 | 8 | 9 | 113 | 38 | 31 | 39 | 38 |
| AVERAGES | 151 | 47 | 14 | 209 | 52 | 48 | 50 | 52 |

2023 Senior Cohort - BS BIO

| | Student Names | Total score (Range is 120-200) | Percentile Scores | | | | Subscore 1: Cell Biology | | | 2: Molecular Biology and Genetics | | | 3: Organismal Biology | | | 4: Population Biology, Evolution, and Ecology | | |
|---|---------------|--------------------------------|---------------------------|-------------------------------|----------------------|----------|--------------------------|------------------------------|----------|-----------------------------------|------------------------------|----------|--------------------------|------------------------------|----------|---|------------------------------|----------|
| | | | Overall 2023 (percentile) | Overall previous (percentile) | Change in Percentile | % change | Raw score Section 1 2023 | Raw score Section 1 previous | % change | Raw score Section 2 2023 | Raw score Section 2 previous | % change | Raw score Section 3 2023 | Raw score Section 3 previous | % change | Raw score Section 4 2023 | Raw score Section 4 previous | % change |
| 1 | | 163 | 79 | 32 | 47 | 147 | 57 | 47 | 21.3 | 60 | 31 | 93.5 | 60 | 48 | 25.0 | 67 | 52 | 28.8 |
| 2 | | 178 | 98 | 82 | 16 | 20 | 70 | 65 | 7.7 | 81 | 55 | 47.3 | 69 | 69 | 0.0 | 77 | 67 | 14.9 |
| 3 | | 136 | 11 | 3 | 8 | 267 | 38 | 27 | 40.7 | 47 | 50 | -6.0 | 29 | 32 | -9.4 | 38 | 20 | 90.0 |
| 4 | | 130 | 4 | 1 | 3 | 300 | 31 | 27 | 14.8 | 47 | 31 | 51.6 | 32 | 35 | -8.6 | 22 | 20 | 10.0 |
| 5 | | 156 | 62 | 8 | 54 | 675 | 54 | 35 | 54.3 | 44 | 38 | 15.8 | 56 | 39 | 43.6 | 63 | 36 | 75.0 |
| 6 | | 147 | 36 | 8 | 28 | 350 | 38 | 27 | 40.7 | 47 | 41 | 14.6 | 48 | 29 | 65.5 | 54 | 48 | 12.5 |
| 7 | | 142 | 23 | 3 | 20 | 667 | 38 | 35 | 8.6 | 38 | 31 | 22.6 | 46 | 32 | 43.8 | 48 | 31 | 54.8 |
| 8 | | 135 | 10 | 7 | 3 | 43 | 23 | 42 | -45.2 | 44 | 23 | 91.3 | 27 | 42 | -35.7 | 50 | 36 | 38.9 |
| 9 | | 142 | 23 | 1 | 22 | 2200 | 35 | 45 | -22.2 | 41 | 31 | 32.3 | 46 | 24 | 91.7 | 48 | 22 | 118.2 |
| | | 148 | 38 | 16 | 22 | 519 | 43 | 39 | 13 | 50 | 37 | 40 | 46 | 39 | 24 | 52 | 37 | 49 |

I

| |
|----|
| 70 |
| 57 |
| 54 |
| 38 |
| 38 |
| 38 |
| 35 |
| 31 |
| 23 |

33%

II

| |
|----|
| 81 |
| 60 |
| 47 |
| 47 |
| 47 |
| 44 |
| 44 |
| 41 |
| 38 |

22%

III

| |
|----|
| 69 |
| 60 |
| 56 |
| 48 |
| 46 |
| 46 |
| 32 |
| 29 |
| 27 |

67%

IV

| |
|----|
| 77 |
| 67 |
| 63 |
| 54 |
| 50 |
| 48 |
| 48 |
| 38 |
| 22 |

44%

148 38 16 22 519 43 39 13 50 37 40 46 39 24 52 37 49

| 2023 Senior Cohort - ALL | | Percentile Scores | | | | Subscore 1: Cell Biology | | | 2: Molecular Biology and Genetics | | | 3: Organismal Biology | | | 4: Population Biology, Evolution, and Ecology | | |
|--------------------------|--------------------------------|---------------------------|-------------------------------|----------------------|-----------|--------------------------|------------------------------|-----------|-----------------------------------|------------------------------|-----------|--------------------------|------------------------------|-----------|---|------------------------------|-----------|
| Student Names | Total score (Range is 120-200) | Overall 2023 (percentile) | Overall previous (percentile) | Change in Percentile | % change | Raw score Section 1 2023 | Raw score Section 1 previous | % change | Raw score Section 2 2023 | Raw score Section 2 previous | % change | Raw score Section 3 2023 | Raw score Section 3 previous | % change | Raw score Section 4 2023 | Raw score Section 4 previous | % change |
| | 163 | 79 | 32 | 47 | 147 | 57 | 47 | 21.3 | 60 | 31 | 93.5 | 60 | 48 | 25.0 | 67 | 52 | 28.8 |
| | 178 | 98 | 82 | 16 | 20 | 70 | 65 | 7.7 | 81 | 55 | 47.3 | 69 | 69 | 0.0 | 77 | 67 | 14.9 |
| AVERAGE | 171 | 89 | 57 | 32 | 83 | 64 | 56 | 14 | 71 | 43 | 70 | 65 | 59 | 13 | 72 | 60 | 22 |

| One Student with only Senior MFT Data | | | | | | | | | | | | | | | | | |
|---------------------------------------|--------------------------------|---------------------------|-------------------------------|----------------------|----------|--------------------------|------------------------------|----------|--------------------------|------------------------------|----------|--------------------------|------------------------------|----------|--------------------------|------------------------------|----------|
| Student Names | Total score (Range is 120-200) | Overall 2023 (percentile) | Overall previous (percentile) | Change in Percentile | % change | Raw score Section 1 2023 | Raw score Section 1 previous | % change | Raw score Section 2 2023 | Raw score Section 2 previous | % change | Raw score Section 3 2023 | Raw score Section 3 previous | % change | Raw score Section 4 2023 | Raw score Section 4 previous | % change |
| | 140 | 19 | N/D | N/D | N/D | 51 | N/D | N/D | 41 | N/D | N/D | 29 | N/D | N/D | 45 | N/D | N/D |

| ALL PreMed Seniors | Total score (Range is 120-200) | Overall 2023 (percentile) |
|--------------------|--------------------------------|---------------------------|
| | 163 | 79 |
| | 178 | 98 |
| AVERAGE | 171 | 89 |

| Raw score Section 1 2023 |
|--------------------------|
| 57 |
| 70 |
| 64 |

| Raw score Section 2 2023 |
|--------------------------|
| 60 |
| 81 |
| 71 |

| Raw score Section 3 2023 |
|--------------------------|
| 60 |
| 69 |
| 65 |

| Raw score Section 4 2023 |
|--------------------------|
| 67 |
| 77 |
| 72 |

| |
|---------------------|
| BS Biology - PreVet |
| BS Biology - PreMed |
| BA Biology |

2023 Senior Cohort - PreVet

| Student Names | Total score (Range is 120-200) | Percentile Scores | | | | Subscore 1: Cell Biology | | | 2: Molecular Biology and Genetics | | | 3: Organismal Biology | | | 4: Population Biology, Evolution, and Ecology | | |
|----------------|--------------------------------|---------------------------|-------------------------------|----------------------|------------|--------------------------|------------------------------|-----------|-----------------------------------|------------------------------|-----------|--------------------------|------------------------------|-----------|---|------------------------------|-----------|
| | | Overall 2023 (percentile) | Overall previous (percentile) | Change in Percentile | % change | Raw score Section 1 2023 | Raw score Section 1 previous | % change | Raw score Section 2 2023 | Raw score Section 2 previous | % change | Raw score Section 3 2023 | Raw score Section 3 previous | % change | Raw score Section 4 2023 | Raw score Section 4 previous | % change |
| | 136 | 11 | 3 | 8 | 267 | 38 | 27 | 40.7 | 47 | 50 | -6.0 | 29 | 32 | -9.4 | 38 | 20 | 90.0 |
| | 130 | 4 | 1 | 3 | 300 | 31 | 27 | 14.8 | 47 | 31 | 51.6 | 32 | 35 | -8.6 | 22 | 20 | 10.0 |
| | 156 | 62 | 8 | 54 | 675 | 54 | 35 | 54.3 | 44 | 38 | 15.8 | 56 | 39 | 43.6 | 63 | 36 | 75.0 |
| | 147 | 36 | 8 | 28 | 350 | 38 | 27 | 40.7 | 47 | 41 | 14.6 | 48 | 29 | 65.5 | 54 | 48 | 12.5 |
| | 142 | 23 | 3 | 20 | 667 | 38 | 35 | 8.6 | 38 | 31 | 22.6 | 46 | 32 | 43.8 | 48 | 31 | 54.8 |
| | 135 | 10 | 7 | 3 | 43 | 23 | 42 | -45.2 | 44 | 23 | 91.3 | 27 | 42 | -35.7 | 50 | 36 | 38.9 |
| | 142 | 23 | 1 | 22 | 2200 | 35 | 45 | -22.2 | 41 | 31 | 32.3 | 46 | 24 | 91.7 | 48 | 22 | 118.2 |
| AVERAGE | 142 | 28 | 5 | 23 | 398 | 40 | 29 | 38 | 46 | 40 | 19 | 41 | 34 | 23 | 44 | 31 | 47 |

| |
|---------------------|
| BS Biology - PreVet |
| BS Biology - PreMed |
| BA Biology |

| Averages | | Percentile Scores | | | | Subscore 1: Cell Biology | | | 2: Molecular Biology and Genetics | | | 3: Organismal Biology | | | 4: Population Biology, Evolution, and Ecology | | |
|----------------|--------------------------------|---------------------------|-------------------------------|----------------------|----------|--------------------------|------------------------------|----------|-----------------------------------|------------------------------|----------|--------------------------|------------------------------|----------|---|------------------------------|----------|
| Degree Program | Total score (Range is 120-200) | Overall 2023 (percentile) | Overall previous (percentile) | Change in Percentile | % change | Raw score Section 1 2023 | Raw score Section 1 previous | % change | Raw score Section 2 2023 | Raw score Section 2 previous | % change | Raw score Section 3 2023 | Raw score Section 3 previous | % change | Raw score Section 4 2023 | Raw score Section 4 previous | % change |
| BS PreVet | 142 | 28 | 5 | 23 | 398 | 40 | 29 | 38 | 46 | 40 | 19 | 41 | 34 | 23 | 44 | 31 | 47 |
| BS PreMed | 171 | 89 | 57 | 32 | 83 | 64 | 56 | 14 | 71 | 43 | 70 | 65 | 59 | 13 | 72 | 60 | 22 |
| BA - ALL | 151 | 47 | 14 | 34 | 209 | 52 | 47 | 10 | 48 | 41 | 15 | 50 | 36 | 44 | 52 | 38 | 42 |