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| **Assurance of Student Learning Report****2023-2024** |
| *Ogden College of Science and Engineering* | *Department of Biology* |
| *Biology (0493)* |
| *Jarrett Johnson, program Coordinator; Kerrie McDaniel, Doug McElroy, Assessment Coordinators* |
| ***Is this an online program***? [x]  Yes [ ]  No | Please make sure the Program Learning Outcomes listed match those in CourseLeaf . Indicate verification here [x]  Yes, they match! (If they don’t match, explain on this page under **Assessment Cycle)** |

**\*\*\* Please include Curriculum Map as part of this document (at the end), NOT as a separate file.**

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| ***Use this page to list learning outcomes, measurements, and summarize results for your program. Detailed information must be completed in the subsequent pages. Add more Outcomes as needed.*** |
| **Program Student Learning Outcome 1:**  Graduates will demonstrate a level of biological content knowledge appropriate to their degree level. |
| **Instrument 1** | Biology Assessment Exam |
| **Based on your results, check whether the program met the goal Student Learning Outcome 1.** | **[ ]  Met** | **[x]  Not Met** |
| **Assessment Cycle Plan:**  |
| During 2023-24 and consistent with it’s five-year assessment plan, the Department of Biology Program Review/Assessment Committee (the ‘Committee’) and faculty (1) assessed 2022-23 artifacts for all SLOs and analyzed results from those assessments; and (2) developed and approved recommendations for program improvements based on assessment findings. These follow-up actions will be undertaken during the 2024-25 academic year, and be fully implemented by Fall 2025. |

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| **Program Student Learning Outcome 1** |
| **Program Student Learning Outcome**  | **Graduates will demonstrate a level of biological content knowledge appropriate to their degree level.** |
| **Measurement Instrument 1**  | **Biology Assessment Exam**The Biology Assessment Exam is an instrument, newly developed in 2020-21, designed to assess content knowledge within the program discipline. The exam is constructed around 14 vignettes, 2 each representing the six major areas of emphasis in our core curriculum (Cells, Metabolism, Genetics, Ecology, Evolution, Diversity); in 2022-23, the assessment exam was expanded to also include 2 vignettes addressing topics related to molecular biotechnology, immunology, and microbiology.These major areas are literally the elements introduced in our required introductory course sequence (BIOL 120/121 and BIOL 122-123), and reinforced in our restricted elective core choices at the 200-level (BIOL 222/223, 224/225, or 226/227) and 300-level (BIOL 319/322 or 327/337 and BIOL 315 or 316). Free elective courses at the 300- and 400-levels provide students the opportunity to further master these topics in more specific contexts aligned with their individual professional interests. Within each area of emphasis, there are 2 vignettes that are associated with 9 multiple-choice questions. Three (3) questions each test student content knowledge at the introductory, developing, and mastery level. In each area, several questions require interpretation of tables and/or figures, and assess students’ ability to apply the scientific process. This exam design allows for redundant assessment of knowledge by area of emphasis as well as mastery level; in addition, it provides the ability to carry out a meta-analysis of higher-order knowledge and skills such as correct interpretation of data and application of the scientific process.The exam is given either electronically or in-person as part of BIOL 500, our required program course that is taken by students during their first semester at WKU. This is an appropriate time to deliver this assessment, as performance on the assessment exam is used by the program and a student’s graduate advisor as a basis for determining the extent and nature of any remedial coursework that will be required in order for a student to complete the program, as well as design the student’s Program of Study. |
| **Criteria for Student Success** | Students will score at least 60% or higher, with the score on Introductory-level items at least 60%. |
| **Program Success Target for this Measurement** | At least 75% of students will attain the criterion level of success. | **Percent of Program Achieving Target** | 0.0% of students attained the criterion level of success, with 50.0% meeting the sub-criterion. The sample size wss 2. |
| **Methods**  | Given that this was the initial implementation of this assessment for the program, and that the sample size is extremely small, we cannot draw any firm conclsuions from patterns of scores within and among content areas. Nevertheless, we can summarize the patterns of this initial assessment. Across all mastery levels, the % correct responses ranged from 11.1% to 38.9%; there was no clear pattern with respect to BIOL 120/121 vs. 122/123 content. Performance on the new module related to biotechnology, immunology, and microbiology was 22.2%; this is not surprising, as these topics are more specialized and targeted at students in our Molecular Biotechnology and Medical Laboratory Science programs, which our graduate certificate students have not experienced.Across all content areas, student performance on introductory-level questions was 28.6%, 11.9% on intermediate-level items, and 28.6% on mastery-level items.  |
| **Based on your results, highlight whether the program met the goal Student Learning Outcome 1.** | **[ ]  Met** | **[x]  Not Met** |
| **Results, Conclusion, and Plans for Next Assessment Cycle (Describe what worked, what didn’t, and plan going forward)** |
| **Results and Conclusions**: The 2021-22 follow-up activity incorporating the new module into the assessment instrument was fulfilled, and met the intent. Our assessment results suggest it would be appropriate and valid to evaluate the extent to which key topics from BIOL 120/121 and BIOL 122/123 and other foundational courses (which form the basis of the assessment exam) are clearly scaffolded across the curriculum. While this is targted directly at enhancing the program for our undergraduate students, it is relevant to the graduate certificate program because this program is intended to offer students a more rigorous, but still broad exposure to major subfields in biology; as such, it is important that our more advanced classes are aligned with the foundational content provided in the analogous undergraduate courses.**Actions:**1. The Committee analyzed 2022-23 assessment results and develop recommendations for program improvement to bring to program faculty. (Spring 2024)2. Program faculty reviewed and approved specific program improvement actions to be undertaken based on assessment findings. (Spring 2024).**Follow-Up:**1. The Committee will work with program faculty to evaluate the degree to which the coverage of important topics in foundational courses is adequate and aligned to promote student learning and success in subsequent courses. (Fall 2024).**Next Assessment Cycle:**2024-25 academic year |

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| **CURRICULUM MAP TEMPLATE** |  |
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| **Program name:** | 0493 Biology Certificate |
| **Department:** | Biology |
| **College:** | Ogden |
| **Contact person:** | Jarrett Johnson |
| **Email:** | jarrett.johnson@wku.edu |
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| **KEY:** |  |  |
| **I = Introduced** |  |  |
| **R = Reinforced/Developed** |  |  |
| **M = Mastered** |  |  |
| **A = Assessed** |  |  |
|  |  |  | **Learning Outcomes** |
|  |  |  | **LO1:** |
|   |  |  | Graduates will demonstrate a degree of biological content knowledge appropriate to their degree level. |
| **Course Subject** | **Number** | **Course Title** |   |
| BIOL | 500 | Introduction to Graduate Studies and Research in Biology (First Semester) | R,M |
| BIOL | 532 | Behavioral Ecology | M |
| BIOL | 543 | Enivronmental Science Concepts | M |
| BIOL | 545 | Animal Communication | M |
| BIOL | 411G | Cell Biology | M |
| BIOL | 446G | Biochemistry I | M |
| BIOL | 495G | Molecular Genetics | M |
| BIOL | 516 | Investigations/Biology (Last Semester) | M,A |