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| **Assurance of Student Learning Report****2022-2023** |
| *Ogden College of Science and Engineering* | *Department of Biology* |
| *Medical laboratory Science (5004)* |
| *Kerrie McDaniel, Program Coordinator; Kerrie McDaniel, Doug McElroy, Assessment Coordinators* |
| ***Is this an online program***? [ ]  Yes [x]  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)** |

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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.** | **[x]  Met** | **[ ]  Not Met** |
| **Program Student Learning Outcome 2:**  Graduates will demonstrate an understanding of research ethics and the responsible conduct of research. |
| **Instrument 1** | CITI Responsible Conduct of Research Course modules |
| **Based on your results, check whether the program met the goal Student Learning Outcome 2.** | **[ ]  Met** | **[x]  Not Met** |
| **Assessment Cycle Plan:**  |
| During 2022-23 and consistent with it’s five-year assessment plan, the Department of Biology Program Review/Assessment Committee (the ‘Committee’) and faculty (1) implemented follow-up activities identified in its 2021-22 ASL Report, and (2) collected artifacts for the next round of bi-annual assessment of all SLOs. These assessment data will be analyzed and form the basis of the 2023-24 ASL Report. |

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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 12 vignettes, 2 each representing the six major areas of emphasis in our core curriculum (Cells, Metabolism, Genetics, Ecology, Evolution, Diversity). 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 during their final semester at WKU. In 2022-23, the assessment exam was expanded to include a 9-question module addressing topics related to molecular biotechnology, immunology, and microbiology. |
| **Criteria for Student Success** | Students will score at least 50% 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** | N/A – this was not an assessment year |
| **Methods**  | N/A. This was not an assessment year. During 202-23, the program implemented follow-up activities identified during the last assessment cycle and in the 2021-22 ASL Report. |
| **Based on your results, highlight whether the program met the goal Student Learning Outcome 1.** | **[x]  Met** | **[ ]  Not Met** |
| **Results, Conclusion, and Plans for Next Assessment Cycle (Describe what worked, what didn’t, and plan going forward)** |
| Results: In the 2021-22 ASL Report, the program developed and implement an additional 9-question module within the assessment exam to focus on topics related to molecular biotechnology, immunology and microbiology, and clinical applications; this module addressed deficiencies in coverage identified during analysis of 2020-21 assessment data. Conclusions: This activity was completed. These new questions were included in the Fall 2022 and Spring 2023 adminsitrations of the assessment, and will be analyzed as part of the 2023-24 ASL Report.Plans for the Next Assessment Cycle: Analyze and report on assessment data collected during 2022-23, and develop follow-up activities based on the findings. |

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| **Program Student Learning Outcome 2** |
| **Program Student Learning Outcome**  | **Graduates will demonstrate an understanding of research ethics and the responsible conduct of research.** |
| **Measurement Instrument 1** | **CITI Responsible Conduct of Research Course Modules**The Collaborative Institutional Training Initiative (CITI) is a web-based ethics training course for responsible conduct in research that has been adopted by the WKU IRB, IACUC, and IBS Committees as a prerequisite certification to be attained by any investigator seeking approval for a research project through one or more of these committees. All PIs, Co-PIs, and Faculty Sponsors are required to complete CITI RCR training and receive certification (based on a minimum score of 80%) across all course training modules. These module educate and evaluate researchers on up-to-date issues and standards of research ethics, research integrity, and researcher conduct.The Physical Science RCR Course used to assess this SLO consists of 7 individual modules: (1) Research Misconduct; (2) Data Management; (3) Authorship; (4) Peer Review; (5) Mentoring; (6) Conflicts of Interest; and (7) Collaborative Research. Within each module, participants review a multimedia presentation and several seminal articles related to the topic. At the end, participants demonstrate competency through a five-question multiple choice test, with test items randomly drawn from a larger question pool.Collection of CITI-RCR artifacts is done electronically during students’ final semester at WKU. Students are required to submit (1) a Completion Certificate indicating that they have attained a minimum score of 80% across all course modules, and (2) individual module scores (percentage of questions answered correctly) from their first attempt. |
| **Criteria for Student Success** | Students will attain the required minimum score for certification, with at least 60% correct answers on each module from their first attempt. |
| **Program Success Target for this Measurement** | At least 75% of students will attain the criterion level of success. | **Percent of Program Achieving Target** | N/A – this was not an assessment year |
| **Methods**  | N/A. This was not an assessment year. During 202-23, the program implemented follow-up activities identified during the last assessment cycle and in the 2021-22 ASL Report. |
| **Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 2.** | **[ ]  Met** | **[x]  Not Met** |
| **Results, Conclusion, and Plans for Next Assessment Cycle (Describe what worked, what didn’t, and plan going forward)** |
| Results: In the 2021-22 ASL Report, the program developed a plan to integrate additional CITI modules into early portions of the curriculum as a means of scaffolding learning Specifically, we committed to (1) require all students in BIOL 121 and 123 to complete the (a) Investigators, Staff, and Students Basic Course, and (b) Physical Sciences Responsible Conduct of Research Course, (2) integrate and require all students in BIOL 223, 225, and 227 to complete the Basic Biosafety Course, (3) require require all students in BIOL 322 and 337 to complete the NIH rDNA Guidelines Course or similar, appropriate CITI course, and (4) integrate and require students who did not complete all CITI courses previously (e.g., transfer students) to do so in BIOL 489/500. Conclusions: This plan was approved by the program faculty, and is in the process of being implemented. Our intent is to integrate these additional modules in a progressive manner through the curriculum, beginning with BIOL 121 and 123 in Fall 2023. Thus, the Fall 2023 entering cohort will experience all of these revisions as they progress.Plans for the Next Assessment Cycle: Analyze and report on assessment data collected during 2022-23, and develop follow-up activities based on the findings. |

**\*\*\* Please include Curriculum Map (below/next page) as part of this document**

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| **CURRICULUM MAP TEMPLATE** |  |  |
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| **Program name:** | 5004 Medical Laboratory Science |  |
| **Department:** | Biology |  |
| **College:** | Ogden |  |
| **Contact person:** | Kerrie McDaniel |  |
| **Email:** | Kerrie.mcdaniel@wku.edu |  |
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| **KEY:** |  |  |  |
| **I = Introduced** |  |  |  |
| **R = Reinforced/Developed** |  |  |  |
| **M = Mastered** |  |  |  |
| **A = Assessed** |  |  |  |
|  |  |  | **Learning Outcomes** |  |
|  |  |  | **LO1:** | **LO2:** |
|   |  |  | Graduates will demonstrate a degree of biological content knowledge appropriate to their degree level. | Graduates will demonstrate an understanding of research ethics and responsible conduct of research. |
| **Course Subject** | **Number** | **Course Title** |   |   |
| BIOL | 120/121 | Biological Concepts: Cells Metabolism and Genetics Lecture/Lab | I | I |
| BIOL | 122/123 | Biological Concepts: Evolution, Diversity, and Ecology Lecture/Lab | I | I |
| BIOL | 226/227 | Microbial Biology and Diversity Lecture/Lab | R | R |
| BIOL | 224/225 | Animal Biology and Diversity Lecture/Lab | R | R |
| BIOL | 319/322 | Introduction to Molecular and Cell Biology Lecture/Lab | R | M |
| BIOL | 327/337 | Genetics Lecture/Lab | R | M |
| BIOL | 328 | Immunology | R | A |
| CHEM | 120/121 | College Chemistry I Lecture/Lab |   |   |
| CHEM | 222/223 | College Chemistry II Lecture/Lab |   |   |
| CHEM | 340/341 | Organic Chemistry Lecture/Lab |   |   |
| MATH | 116/117 | College Algebra and Trigonometry |   |   |
| BIOL | 407 | Virology | M |   |
| BIOL | 411/412 | Cell Biology Lecture/Lab | M |   |
| BIOL | 446/447 | Biochemistry Lecture/Lab | M |   |
| BIOL | 470 | Pathogenic Microbiology | M |   |
| BIOL | 492 | Internship in Medical Lab Science | A |   |
| BiOL | 493 | Internship in Medical Lab Science | A |   |
| BIOL | 494 | Internship in Medical Lab Science | A |   |