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| **Assurance of Student Learning Report**  **2020-2021** | |
| *Ogden College of Science and Engineering* | *Department of Biology* |
| *Medical Laboratory Science (5004)* | |
| *Kerrie McDaniel, Program Coordinator; Kerrie McDaniel, Doug McElroy, Assessment Coordinators* | |

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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.*** | | | |
| **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** | **Not Met** |
| **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** | **Not Met** |
| **Program Summary (Briefly summarize the action and follow up items from your detailed responses on subsequent pages.)** | | | |
| During 2020-21, the Department of Biology Program Review/Assessment Committee (the ‘Committee’) developed and program faculty adopted substantially revised student learning outcomes and means of assessment for this and all other programs. This overhaul was driven by the recognition from prior assessments that the previous SLOs and/or their means of assermment were not in all cases direct measures of student learning and/or did not provide sufficient direct evidence to inform program improvement. In addition, recent adoption of a Biology Process Course requirement for 3 of 4 undergraduate programs necessitated significant modification to our means of assessment of the prior process-related SLO.  The Process Course requirement does not apply to program 5004, so the related SLO is not assessed in this program. This is appropriate as this program is a 3+1 program, wherein students complete their first 3 years of study at WKU, and then enter a hospital based, National Accreditation Agency for Clincal Laboratory Science (NAACLS)-accredited Medical Laboratory Science (MLS) professional school. The professional school curriculum and assessment thereof is beyond the control of WKU, but (per accreditation requirements) focuses on developing students’ professional skills – including process. Sudents who complete the professional school program have those credits back-transferred to WKU for awarding of their bachelor’s degree.  The specific action steps taken based on prior assessments were: (1) to develop and approve revised SLOs for all programs; (2) develop a new assessment instrument for SLO1 aligned with the curriculum core; (3) develop and adopt a means and protocol for assessing SLO2; (4) develop a new five-year plan for program assessment; (5) generate a fully-developed curriculum map for all SLOs; and (6) collect baseline data for all SLOs.  Specific follow-up items for 2021-22 per our five-year assessment plan are to: (1) assess 2020-21 artifacts for all SLOs and analyze results from those assessments; (2) develop and approve recommendations for program improvements based on assessment findings; and (3) evaluate new assessments instruments and processes for collecting assessment data. | | | |

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| **Student Learning Outcome 1** | | | | | |
| **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, Microbiology/Immunology). 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 224/225 or 226/227) and 300-level (BIOL 319/322 or 327/337, and BIOL 428). 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 for students in this program, with delivery coordinated by the program coordinator during students’ last semester at WKU (prior to entering professional school) or during their clinical year. | | | | |
| **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 – data to be assessed and reported in 2021-22 report | |
| **Methods** | All students completing program requirements and accepted into professional school course are intended to be assessed. This will generate a sample size of 2-8 each assessment year. Data for two successive academic years may be pooled to increase sample size. | | | | |
| **Based on your results, highlight whether the program met the goal Student Learning Outcome 1.** | | | | **Met** | **Not Met** |
| **Actions** (Describe the decision-making process and actions for program improvement. The actions should include a timeline.) | | | | | |
| 1. The Committee secured approval of this SLO and means of assessment from program faculty. (Fall 2020)  2. The Committee developed the new Biology Assessment Exam as the assessment instrument. (Fall 2020, Spring 2021)  3. The Committee evaluated the new assessment exam and its implementation. (Spring 2021)  4. The Committee generated a fully-developed curriculum map for this SLO. (Spring 2021). | | | | | |
| **Follow-Up** (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.) | | | | | |
| 1. The Committee will work with the program director to administer the assessment exam to students enrolled in BIOL 492/493 during their clinical year (Fall 2021).  2. The Committee will analyze 2020-21 assessment results and develop recommendations for program improvement to bring to program faculty. (Fall 2021)  3. The Committee will move from an in-person to electronic delivery format for the assessment exam. This electronic delivery system will be piloted during the 2021-22 AY, in preparation for the collection of mid-cycle assessment data during 2022-23, for inclusion in the 2023/24 report.  4. Program faculty will review/revise and approve specific program improvement actions to be undertaken based on assessment findings. (Spring 2022). | | | | | |
| **Next Assessment Cycle Plan** (Please describe your assessment plan timetable for this outcome) | | | | | |
| Baseline assessment results and recommendations for program improvement will be reported as part of the 2021-22 report. The SLO will then be assessed on an alternating year basis, with next (mid-cycle) results and recommendations included in the 2023/24 report. To allow for longitudinal comparison, the same assessment instrument will be used. Assessments will be delivered by the program coordinator and analyzed by the Department of Biology Program Review/Assessment Committee. | | | | | |

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| **Student Learning Outcome 2** | | | | | |
| **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 froma larger question pool.  Completion of CITI RCR training is required of all students completing program requirements and accepted into professional school. During their final semester at WKU prior to graduation, students are required to submit to the program coordinator (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 – data to be assessed and reported in 2021-22 report | |
| **Methods** | All students completing program requirements and accepted into professional school course are intended to be assessed. This will generate a sample size of 2-8 each assessment year. Data for two successive academic years may be pooled to increase sample size. | | | | |
| **Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 3.** | | | | **Met** | **Not Met** |
| **Actions** (Describe the decision-making process and actions for program improvement. The actions should include a timeline.) | | | | | |
| 1. The Committee secured approval of this SLO and means of assessment from program faculty. (Fall 2020)  2. The Committee generated a fully-developed curriculum map for this SLO. (Spring 2021). | | | | | |
| **Follow-Up** (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.) | | | | | |
| 1. The committee will work with the program director to assign and collect data from the CITI training modules among students enrolled in BIOL 492/493 during their clinical year. (Fall 2021)  2. The Committee will analyze 2020-21 assessment results and develop recommendations for program improvement to bring to program faculty. (Fall 2021)  3. Program faculty will review/revise and approve specific program improvement actions to be undertaken based on assessment findings. (Spring 2022). | | | | | |
| **Next Assessment Cycle Plan** (Please describe your assessment plan timetable for this outcome) | | | | | |
| Baseline assessment results and recommendations for program improvement will be reported as part of the 2021-22 report. The SLO will then be assessed on an alternating year basis, with next (mid-cycle) results and recommendations included in the 2023/24 report. To allow for longitudinal comparison, the same assessment instrument will be used. Assessments will be collected by the program coordinator and analyzed by the Department of Biology Program Review/Assessment Committee. | | | | | |