**Assessment Plan**

**for Workforce and FOS Programs**

**Program/Track Name: \_\_\_\_\_\_\_\_\_\_\_Biotechnology\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Description of Program-Level Learning Outcomes**

Please indicate the Program Learning Outcomes for the degree, degree track, or certificate below:

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| Program-Level Learning Outcomes | |
| Program Learning Outcome 1: | Students will be able to use laboratory math techniques to calculate dilutions and plan multicomponent solutions. |
| Program Learning Outcome 2: | Students will demonstrate accurate pipetting skills. |
| Program Learning Outcome 3: | Students will demonstrate proper sterile technique and use of a laminar flow hood. |
| Program Learning Outcome 4: | Students will understand how to prepare and run an electrophoresis gel and use graphs to interpret DNA sizes. |
| Program Learning Outcome 5: | Students will be able to demonstrate understanding of the approval process for new drugs. |
| Program Learning Outcome 6: | Students will be able to evaluate and troubleshoot the results from a bacterial transformation. |
| Program Learning Outcome 7: |  |
| Program Learning Outcome 8: |  |

**Section I: Technical Courses**

For **all technical courses** in the program, indicate in the table on the following page whether and/or how the course will support the program learning outcomes. You should include courses outside your discipline area and work collaboratively with those disciplines to determine whether and/or how those course(s) will support the program learning outcomes. **Please note** that it is understandable if courses from outside the discipline do not assess the program-level learning outcomes and serve only to introduce, practice and/or emphasize the program outcomes. It is also possible that technical courses outside of your discipline may not directly support the specific program-level learning outcomes you have identified.

***How to complete the program map:***

For each technical course in your program, please indicate whether any program-level learning outcome is introduced to students (I), practiced by students (P), emphasized for students (E), or formally assessed (A).

For example, if course WXYZ 1234 introduces students to one of the program outcomes, then enter “I” for that specific program outcome in the appropriate column. Please note that a course can be “I”, “P”, “E” and/or “A” in any program outcome. The labels in the following table apply SOLELY to the program level learning outcomes defined above. (It is NOT necessary for every course to address a program level learning outcome, and it is NOT necessary that Assessment or program level learning outcomes occur in every course.)

**Program Map ▼**

I=Introduced P=Practiced E=Emphasized A=Assessed

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| Program Courses | Program Learning Outcome 1 | Program Learning Outcome 2 | Program Learning Outcome 3 | Program Learning Outcome 4 | Program Learning Outcome 5 | Program Learning Outcome 6 | Program Learning Outcome 7 | Program Learning Outcome 8 |
| BIOL 1414 | A | P | I | A | I | P |  |  |
| BIOL 1415 | P | A | P | P | E | P |  |  |
| BITC 1340 |  |  |  |  | A | I |  |  |
| BITC 2431 | P | P | A | E | I | E |  |  |
| BITC 2486 |  |  |  |  |  |  |  |  |
| BIOL 1406 | I | I | I | I |  | I |  |  |
| MATH 1314 | E |  |  |  |  |  |  |  |
| BIOL 2416 | P | A | P | P |  | A |  |  |
| CHEM 1411 | E |  |  |  |  |  |  |  |
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**Assessment Plan for Program Learning Outcomes**

Review existing assessment methods and current practices for collecting/gathering student data to identify direct (and possibly indirect methods of assessment). Remember that the data will need to be gathered, analyzed, and used to support the program’s continuous improvement processes.

**Note:** Because courses from other disciplines already have assessment plans in place, they do not have to be included in this assessment plan. Nonetheless, proposers must work collaboratively with these other disciplines to stay current and up-to-date with the assessment plans in these courses.

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| Program-Level Learning Outcome (e.g. Students will describe the impact of various cultures on American cuisine.) | Assessment Measure(s) and Where Implemented in Curriculum – Description of Instrument(s)/ process(es) used to measure results and indication of where the assessment will be collected in curriculum. (e.g. Essay on Cultural influences on American cuisine in CUIS 1300.) | Targets- Level of Success Expected  (e.g. 80% of students score 2.5 or better on rubric for essay on cultures and cuisine.) |
| Students will be able to use laboratory math techniques to calculate dilutions and plan multicomponent solutions. | In BIOL 1414, students will be given a quiz that assesses their ability to make calculations and describe the making of solutions of varying concentrations. | 75% of students score a 70% or better |
| Students will demonstrate accurate pipetting skills. | In BIOL 1415 and BIOL 2416, students will test their accuracy and precision with a lab exercise in pipetting volumes of less than one milliliter (Two courses have been chosen because this is a very important skill and we wish to assess it with more students. This also will allow us to assess mastery in both certificates). | 70% of students will have an error rate of less than 5% by r-squared value. |
| Students will demonstrate proper sterile technique and use of a laminar flow hood. | In BITC 2431, one section on the practical exam will evaluate the student’s sterile technique and proper use of a laminar flow hood. | 80% of students score 75% or better on this portion of the practical exam |
| Students will understand how to prepare and run an electrophoresis gel and use DNA mobility graphs to interpret DNA sizes. | In BIOL 1414, students will prepare and load a gel with DNA samples of unknown size, and will use graphed data from a set of molecular size standards to determine the sizes of the unknowns. | Students will be able to estimate the sizes of the unknowns with an error rate of less than 10% |
| Students will be able to demonstrate understanding of the approval process for new drugs. | In BITC 1340, students will answer an essay question related to the rejection of the drug thalidomide from use in the United States. The question will be presented as a class discussion or as an exam question. | 80% of students will score an 80% or better |
| Students will be able to evaluate and troubleshoot the results from a bacterial transformation. | In BIOL 2416, students will answer quiz questions that ask them to describe the expected results from a bacterial transformation, and questions that ask them to hypothesize reasons that a different result occurred. | 70% of students will score 90% or better on these questions. |