



Assurance of Student Learning Assessment Plan

for Academic Programs

All academic programs that lead to a transcribed credential (graduate programs, baccalaureate/associate programs, and all certificate programs) must complete an assessment plan when the program is created through the University’s curriculum approval process. As part of continuous improvement, assessment plans are dynamic documents that evolve based on revisions to the program, observations, and data changes.

As improvements and adjustments are made to ensure program quality and student success, assessment plans should be revised to reflect changes. resubmitted if revisions are made to the plan.

SECTION I: PROGRAM INFORMATION

Select One of the Following Options	Program Title: Biology		
<input type="checkbox"/>	New Academic Program	Reference Number: 525	
<input checked="" type="checkbox"/>	Revised Plan	College: Ogden College of Science & Engineering	
Program Coordinator: Kerrie McDaniel			
Where revisions made to this academic program in the past academic year? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
2025-2030	Is this program accredited? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <i>If YES, please identify the accrediting agency.</i> [INSERT ACCREDITOR’S NAME, IF APPLICABLE]		
	Current Academic Year:		
Please choose one of the following:			
<input type="checkbox"/>	<i>The department/school verified the program learning outcomes match those approved in CourseLeaf through the curriculum approval process.</i>		
<input checked="" type="checkbox"/>	<i>The learning outcomes do not match those approved in CourseLeaf. Use the below space to explain why.</i>		
<p>As a result of the most recent 5-year Assessment Plan cycle, the department is in the process of retiring and replacing PLO2 and/or its means of assessment. The current means of assessment – CITI training in research ethics - has been fully scaffolded throughout the curriculum, so there is no need to continue this PLO as currently constructed. The specific language of PLO2 is still being developed, but it will continue to be perspectives-focused, as a complement to PLO1 (knowledge) and PLO3 (skills).</p>			

All sections of the assessment plan must be completed. A rubric is provided at the end of this document to help guide completion and to serve as a self-assessment.

SECTION II: ROLES & RESPONSIBILITIES

Use the below space to discuss who will be responsible for completing the annual assessment process and how all program faculty will be involved in the process.

The departmental Assessment Committee, which is chaired by the 525 program coordinator Dr. McDaniel, will have primary responsibility for completing the assessment process, analyzing assessment data and using the results to recommend follow-up actions intended to improve the program. Program faculty teaching BIOL 489 participate in the assessment process by administering the assessment exam for PLO1 and the ethics assignment for PLO2. All program faculty participate as 2-person teams in assessing science process artifacts submitted by graduating seniors for PLO3, and in discussing, revising as necessary, and approving recommendations for follow-up activities to improve the program.

SECTION III: PROGRAM LEARNING OUTCOMES

In this section, program learning outcomes will be stated along with the measurement plan, targets, and timeline for assessment. Please note that not all learning outcomes need to be assessed in a single year; however, all learning outcomes must be assessed by the end of year 5.

Program Learning Outcome (PLO) 1

Graduates will demonstrate a level of biological content knowledge appropriate to their degree level.

PLO 1 Artifacts & Instruments

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 489, our required program capstone course that is taken by students during their final semester at WKU prior to graduation.

PLO 1 Criterion for Success

Students will score at least 50% or higher, with the score on Introductory-level items at least 60%.

PLO 1 Timeline

2026/27, 2028/29, 2030/31

Program Learning Outcome (PLO) 2

Graduates will demonstrate the ability to evaluate the ethical dimensions of a contemporary issue of public importance related to their chosen career field. **[Note: the language of this PLO is tentative at this point.]**

PLO 2 Artifacts & Instruments

Biology Ethical Issues Artifact

As part of BIOL 489, students are given an assignment to identify a contemporary issue within their chosen curricular concentration/career field and evaluate the ethical dimensions surrounding it. For example, students in the Pre-Medical Professions concentration may chose a topic related to access to health care, while Molecular Biotechnology students might consider the ongoing debate over genetically-modified foods, and Ecology, Wildlife & Conservation students may discuss the pros can cons of ecotourism. **[Note: the specifics of the assignment are tentative at this point.]**

Artifacts are peer-evaluated by 4-student teams using elements taken from the AAC&U LEAP Ethical Reasoning rubric; generative AI is also used to independently assess artifacts. When ratings differ by more than 25% across all rubric elements among student raters and/or AI, artifact ratings are reconciled either by discussion among team members or with the faculty member.

PLO 2 Criterion for Success

Students will receive a rating of 3.0 or higher across all rubric elements, with no rubric element below 3 (out of 4).

PLO 2 Timeline

2026/27, 2028/29, 2030/31

Program Learning Outcome (PLO) 3

Graduates will demonstrate the ability to apply scientific methodology and field/laboratory/analytical skills to a biological question.

PLO 3 Artifacts & Instruments

Representative Biology Process Artifact

All students in the program are required to successfully complete one of several approved process courses, which incorporate specific course SLOs related to application of the scientific process to address relevant questions in biology. In addition, many students undertake faculty-directed independent research. Both these experiences yield artifacts – such as evidence and argument papers, research presentations or posters, Honors CE/T projects, or manuscripts – that allow for assessment of this SLO.

As part of BIOL 489, students are required to submit the artifact from their process course(s) or independent research experience that they consider to be both representative of their best work as well as best aligned with the elements of the assessment rubric for this SLO.

Artifacts are assessed by 2-person program faculty teams using the AAC&U LEAP Ethical Reasoning rubric. Faculty teams independently assess each artifact they are assigned; when faculty ratings differ by more than 25% across all rubric elements, artifact ratings are reconciled either by a third reviewer or by discussion between team members.

PLO 3 Criterion for Success

Students will receive a rating of 3.0 or higher across all rubric elements, with no rubric element below 3 (out of 4).

PLO 3 Timeline

2026/27, 2028/29, 2030/31

SECTION IV: USE OF RESULTS

Use the below space to explain how individual assessment results for each PLO will guide the continuous improvement process within the program.

PLO1: Data and subgroup/meta-analyses by content area and mastery level of assessment exam items will allow us to identify and curricular gaps that may exist; this will be especially important given that the 525 major was revised in 2025/26 to incorporate 7 career-focused curricular concentrations, each with somewhat distinct curricular pathways. In addition, analysis of student performance by mastery level will enable us to ensure that our curriculum is appropriately scaffolded from introductory level courses through restricted elective courses through upper-division concentration electives.

PLO2: The LEAP AAC&U Ethical Reasoning rubric used to assess PLO2 contains three items representing ethical issue recognition and application/evaluation of different ethical perspectives with respect to the issue at hand. Analysis of assessment data by these categories will allow us to identify and gaps in students' abilities to appreciate the ethical dimensions of complex issues in their chosen field. This will in turn enable us to adjust our curricula in ways to mitigate any deficiencies that may exist.

PLO3: The LEAP AAC&U Inquiry and Analysis rubric used to assess PLO3 artifacts contains two items each representing information literacy, analysis/interpretation, and application/implications. Subgroup analysis of assessment data by these three categories will allow us to identify any gaps in students' skills at gathering appropriate evidence, analyzing applying that evidence to address critical questions in the biological sciences. This in turn will enable us to adjust our curricula in ways to mitigate any deficiencies that may exist; in addition, we will be in a position to identify necessary changes to specific course assignments to ensure that students are prompted to address the important elements of the PLO as reflected in the rubric.

SECTION V: SKILLS-BASED ASSESSMENT

In this section, programs will use their skills curriculum map to address the specific skills in which their graduates will achieve mastery. These answers are narrative-based.

Essential Skill 1

2. Critical and Creative Thinking: Graduates will think critically by evaluating assumptions and assessing information to make informed conclusions. They will also think creatively by combining ideas in original ways or developing new ways of addressing issues.

What artifacts (specific assignments) or assessments will be used throughout the program to help the student master this skill?

BIOL 121/123 inquiry-based lab projects (introductory artifacts), field and lab reports in various mid-level courses (reinforcing artifacts), science process artifact (culminating artifact).

How will the program faculty help students connect content knowledge to workplace settings?

Faculty in designated science process courses (culminating experience related to this essential skill) will guide students in carrying out an inquiry-based study related to the content discipline and produce a product (written paper, scientific manuscript or presentation) relevant to their chosen career and workplace setting.

How will the program use assessment data to continuously improve mastery in these skills?

See Section IV: Use of Results for PLO2, PLO3.

Essential Skill 2

6. Professionalism: Graduates will adhere to the code of ethics in their chosen profession and act with honesty and fairness.

What artifacts (specific assignments) or assessments will be used throughout the program to help the student master this skill?

BIOL 120/122 students' completion of CITI training in Responsible Conduct of Research (introductory artifact), completion of additional content-relevant CITI modules in various mid-level and upper-division courses (reinforcing artifacts), ethical reasoning assignment in BIOL 489 (culminating artifact).

How will the program faculty help students connect content knowledge to workplace settings?

Faculty in BIOL 489 (culminating experience related to this essential skill) will guide students in carrying out a reflective analysis of a current ethical issue within their curricular concentration and chosen career and workplace setting, and produce a written paper summarizing relevant points of view and ethical considerations related to the topic at hand.

How will the program use assessment data to continuously improve mastery in these skills?

See Section IV: Use of Results for PLO2.

Essential Skill 3

9. Knowledge Application: Graduates will articulate and apply the theoretical content of their academic preparation with relevant knowledge and abilities essential to their chosen careers.

What artifacts (specific assignments) or assessments will be used throughout the program to help the student master this skill?

Exams and assignments scaffolded throughout the curriculum, BIOL 489 assessment exam (culminating artifact).

How will the program faculty help students connect content knowledge to workplace settings?

The curricula for each of the seven concentrations within the program are tailored to provide students the necessary knowledge and skills essential for success in their chosen career field and workplace setting. Program faculty help guide students' development of relevant knowledge and its application through the structure of content delivery and use of authentic assessments.

How will the program use assessment data to continuously improve mastery in these skills?

See Section IV: Use of Results for PLO1.

Essential Skill 4

10. Information Literacy: Graduates will identify, evaluate, and responsibly use information needed for decision-making.

What artifacts (specific assignments) or assessments will be used throughout the program to help the student master this skill?

BIOL 121/123 inquiry-based lab projects (introductory artifacts), field and lab reports in various mid-level courses (reinforcing artifacts), science process artifact (culminating artifact).

How will the program faculty help students connect content knowledge to workplace settings?

Faculty in designated science process courses (culminating experiences related to this essential skill) will guide students in carrying out an inquiry- and literature-based study related to the content discipline and produce a product (written paper, scientific manuscript or presentation) relevant to their chosen career and workplace setting.

How will the program use assessment data to continuously improve mastery in these skills?

See Section IV: Use of Results for PLO3.

SECTION VI: CURRICULUM MAP

All assessment plans must include a curriculum map using the template provided at https://www.wku.edu/academicaffairs/ee/assurance_learning_resources.php. Undergraduate programs must also include a Skills-Based Curriculum Map as required by CPE's Kentucky Graduate Profile Initiative. Curriculum maps should be uploaded separately.

Assessment Plan Rubric

	Needs Attention	Meets Standards	Best Practice
Roles and Responsibilities	Does not yet meet the described standard.	The program has identified who coordinates the assessment of program learning goals.	In addition to meeting the described standard, program faculty, including adjuncts as appropriate, understand their role and responsibilities in assessing student achievement or program learning goals. Faculty periodically reflect on their assessment efforts and identify ways to keep it as simple and useful as possible.
Program Learning Outcomes	Learning goals do not yet meet the described standard.	Learning goals describe in explicit, observable terms, using action words, how students will be able to use their knowledge, what thinking skills and disciplinary dispositions they will have, and/or what else they will be able to do upon completion of the program.	In addition to meeting the described standard, program learning outcomes are clearly and actively communicated to students and faculty in the program.
Artifacts (Method), Instruments, and Criterion for Success	Does not yet meet the described standard.	Each assessment method clearly matches the learning goals being assessed, and multiple assessments are used systematically over time.	In addition to meeting the described standard, evidence is provided that the assessment methods yield truthful, fair information through instruments that can be used with confidence. Program faculty have defined and justified rigorous but achievable standards for satisfactory achievement of each program learning goal.
Continuous Improvement	Does not yet meet the described standard.	The program outlines a plan for sharing assessment results and collaborating with program faculty for continuous improvement. The plan articulates the different ways assessment results could lead to program revisions.	In addition to meeting the described standard, the assessment plan addresses collaboration with external stakeholders to share assessment results and receive feedback for continuous improvement.
Skills-Based Assessment <i>(Undergraduate Programs Only)</i>	Does not yet meet the described standard.	Every student has the opportunity to master specific workforce skills identified by the program through skills-mapping and a plan is in place for communicating skills taught in program courses.	In addition to meeting the described standard, faculty include departmental plans to assess skills within the program outside of the University Skills Self-Assessment Initiative.
Curriculum Map	Does not yet meet the described standard.	Every student has sufficient opportunity to achieve the learning goal, taking at least two courses that address the learning goal.	In addition to meeting the described standard, faculty collaborate to ensure curricular alignment with program learning outcomes, and every student in the major has ample opportunity to master the learning goal through more than two courses.

Rubric adapted from:

Suskie, L. A. (2018). *Assessing student learning: A common sense guide* (3rd ed.). Jossey-Bass.