AC 2025-2026 Assessment

Natural Sciences. To understand the universe through the study of life and physical sciences.

Prepared by: Christopher N. Lyles **Date: 5/28/2026**

Approved by: Greg Handel, Provost **Date: 2 Jun 2026**

Northwestern Mission. Northwestern State University is a responsive, student-oriented institution that is committed to the creation, dissemination, and acquisition of knowledge through teaching, research, and service. The University maintains as its highest priority excellence in teaching in graduate and undergraduate programs. Northwestern State University prepares its students to become productive members of society and promotes economic development and improvements in the quality of life of the citizens in its region.

Northwestern Core Curriculum. Northwestern has a broadly-based core curriculum that is central to the University's mission and consistent with the Louisiana Board of Regents' requirements for general education survey courses applicable to all students regardless of their major. The core encompasses the knowledge and abilities that Northwestern believes are essential to college graduates. Its requirements are designed to improve students' writing and speaking, to expand students' aptitude in mathematics and its applications, to strengthen students' understanding of biological, physical, social, and behavioral sciences, and to develop an appreciation and knowledge of the arts and humanities.

The goal of the core curriculum is for undergraduate students, depending on their respective degree program, to obtain appropriate learning outcomes for this general education competency.

Methodology: The assessment process includes:

(1) Data from assessment tools (direct and quantitative) are collected and returned to the executive director:

(2) The executive director will analyze the data to determine whether the applicable outcomes are met.

(3) Results from the assessment will be discussed with the appropriate staff; Individual meetings will be held with staff as required.

(4) The executive director, in consultation with the staff and senior leadership, will determine proposed changes to measurable outcomes, assessment tools for the next assessment period and, where needed, service changes.

NOTE: Each student is required to complete 3 separate natural science courses (9 credit hours total):

- One introductory physical science course (either SCI1010, CHEM1030, CHEM1070, or PHYS2030)

- One introductory biological science course (either SCI1020, BIOL1010, or BIOL2250)
- Either a second physical science course (either SCI2010 or CHEM1040) or a second biological science course (either SCI2020 or BIOL2260).

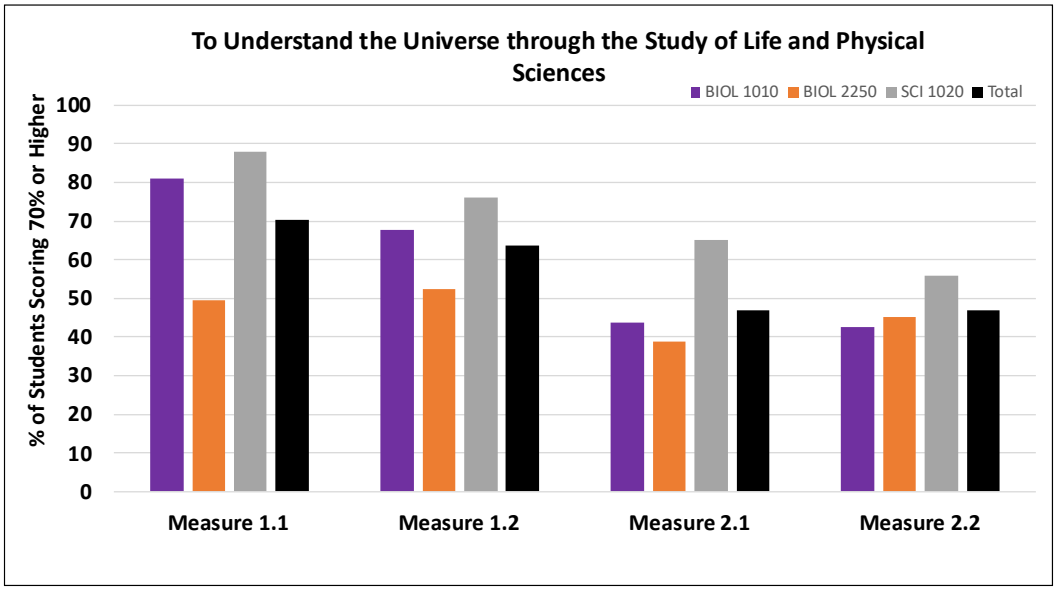
Students can be broadly categorized into three different groups: (1) non-science majors, (2) science majors, or (3) nursing/allied health majors. For each of these three groups of students, there is a typical series of natural science courses that are taken but the timing and order of these courses varies significantly among the groups. The course series taken by the different student groups is as follows:

- Non-science majors – SCI1010, SCI1020, and then either SCI2010 or SCI2020
- Science majors – BIOL1010, CHEM1030, and CHEM1040
- Nursing/allied health majors – BIOL2250, BIOL2260, and CHEM1070

If the natural science competencies were assessed in EACH of the natural science core courses, every student would be assessed three times, which would be redundant and skew the collected data. Therefore, a representative set of courses were selected to assess the natural sciences competencies. The courses selected for assessment are:

- BIOL1010 – taken by all science majors
- BIOL2250 – taken by all nursing/allied health majors
- SCI1020 – taken by all non-science majors

By assessing students in EACH of these selected courses every Fall and Spring semesters, we are monitoring the learning outcomes of 75% of the students in university core natural science courses.



SLO 1 Students will identify the parts of the scientific method and design scientifically-sound experiments.
Measure 1.1 – Students will identify the parts of the scientific method.

AC 2025-2026 Assessment

Measure 1.2 – Students will demonstrate the ability to recognize scientifically – sound experiments.
SLO 2 Students will analyze scientific data to draw conclusions about the natural and physical world.
Measure 2.1 – Students will demonstrate their ability to make experimental predictions.
Measure 2.2 – students will analyze scientific data to draw conclusions about the natural and physical world.

Service Learning Outcomes (SLO):

SLO 1. Students will identify the parts of the scientific method and design scientifically-sound experiments.

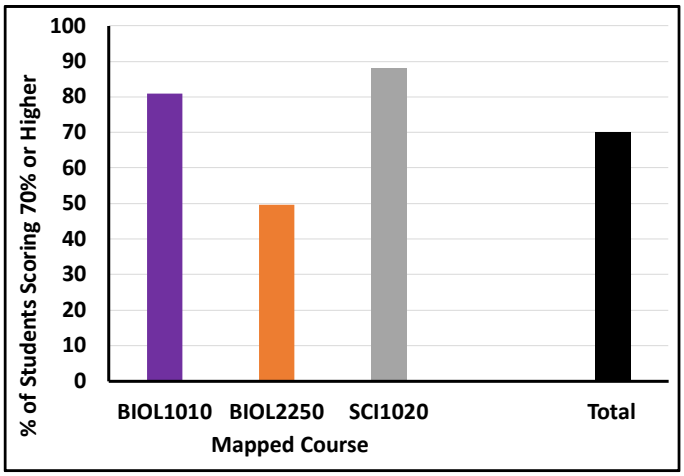
Measure 1.1. Students will identify the parts of the scientific method.

Throughout the indicated courses, students will learn about the parts of the scientific method including observations, hypotheses, and the various forms of experimental variables. Each student is required to pass a quiz covering these concepts. The target is to have 50% of students attain a quiz grade of ≥70%.

Course Name	Methodology	Total students Assessed	Number above 70%	Target percentage	Term
BIOL 1010	Quiz	**368**	**298**	**80.978**	Fall and Spring
BIOL2250	Quiz	**417**	**207**	**49.64028777**	Fall and Spring
SCI1020	Quiz	**260**	**229**	**88.07692308**	Fall and Spring
Total		**1045**	**734**	**70.23923445**	

Finding. Target Met. 1045 Students assessed: 659 in Fall 2025 and 386 in Spring 2026; 205 dual enrollment students assessed: 103 in Fall 2024 and 102 in Spring 2025.

Graph.



Measure 1.1 – Students will identify the parts of the scientific method. Data from AC 2025 – 2026.

AC 2025-2026 Assessment

Analysis. In AC 2017-2018, the natural sciences core competency consisted of a single student learning outcome with a single measure. The University modified its General Education Core Curriculum, ensuring that its six key competencies are central to the mission and are consistent with the Louisiana Board of Regents' requirements for general education. In response, the natural sciences' core competency was changed to the following: To understand the universe through the study of life and physical sciences. This new core competency has two different student learning outcomes, each with two different measures. New quiz-based assessments were designed and implemented for the first time during AC 2018-2019 and the target was lowered from 80% to 50% after the AC 2024-2025 assessment. In AC 2025-2026, the target was met with 70.239% (1045/734) of students scoring 50% or higher on the quiz. This is higher (+20.239%) than our goal of 50% of students in BIOL 1010, BIOL 2250, and SCI 1020 scoring ≥70% on the quiz, but lower (-7.402%) than the AC 2024-2025 (77.641%; 735/947). Based on the analysis of the 2024-2025 results, the director met with the Director of Institutional effectiveness and the decision was made to lower 80% goal to 50%. That is the new assessment goal is to have 50% of the students score ≥70% on the quiz assessment. Based on the analysis of these results, we see success with our students for SLO1.1 and SLO1.2 but still need enhanced instruction for our BIOL 2250 students as well as the individual parts of the scientific method with emphasis on the different aspects of the scientific method.

Decision or action to drive future improvement. Based on the analysis of the results from AC 2024-2025, in AC 2026-2027, we will implement the following changes to drive the cycle of continuous improvement:

- The Director of STEM will meet with the Director of Institutional Effectiveness to determine if we need to reduce the percentage based on the 2025-2026 assessment.

- The Director of STEM and Department Head of Biology and Microbiology will meet with all BIOL 1010, 2250, and SCI 1020 course stewards and instructors during on-call week to make sure they understand the assessment process and to check whether it is on the instructors Moodle page.

- Put emphasis on BIOL 2250 instructors to explain the scientific method and ensure they understand the assessment process.

- Based on the data we will increase instructional time on the different types of experimental variables, which is a difficult concept for many students.

Measure 1.2. Students will demonstrate the ability to recognize scientifically-sound experiments.

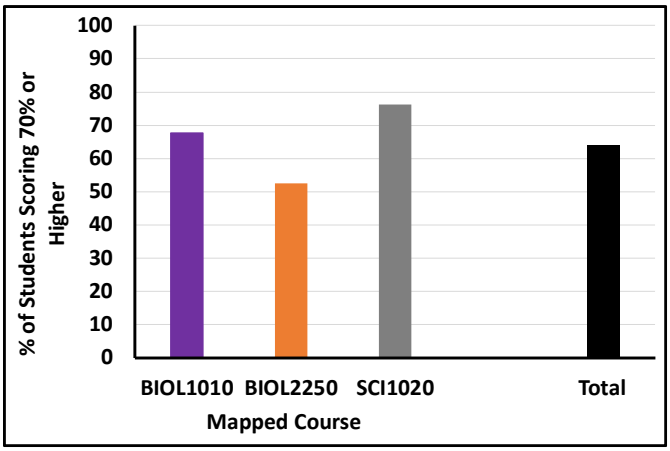
Throughout the indicated courses, students will learn how to use their knowledge of the parts of the scientific method to design scientifically-sound experiments. This will require the ability to identify relevant dependent and independent variables and

understand how to use them to design appropriate experiments to test a given hypothesis. Each student is required to pass a quiz covering these concepts. The target is to have 50% of students attain a quiz grade of ≥70%.

Course Name	Methodology	Total students Assessed	Number above 70%	Target percentage	Term
BIOL 1010	Quiz	**368**	**249**	**67.663**	Fall and Spring
BIOL2250	Quiz	**417**	**219**	**52.518**	Fall and Spring
SCI1020	Quiz	**260**	**198**	**76.154**	Fall and Spring
Total		**1045**	**291**	**63.732**	

Finding. Target Met. 1045 Students assessed: 659 in Fall 2025 and 386 in Spring 2026; 205 dual enrollment students assessed: 103 in Fall 2024 and 102 in Spring 2025

Graph.



Measure 1.2 – Students will demonstrate the ability to recognize scientifically – sound experiments. Data from AC 2025 – 2026.

Analysis. In AC 2017-2018, the natural sciences core competency consisted of a single student learning outcome with a single measure. The University modified its General Education Core Curriculum, ensuring that its six key competencies are central to the mission and are consistent with the Louisiana Board of Regents' requirements for general education. In response, the natural sciences' core competency was changed to the following: To understand the universe through the study of life and physical sciences. This new core competency has two different student learning outcomes, each with two different measures. New quiz-based assessments were

designed and implemented for the first time during AC 2018-2019 and the target was lowered from 80% to 50% after the AC 2024-2025 assessment. In AC 2025-2026, the target was not met with 63.732% (1045/666) of students scoring 70% or higher on the quiz. This is Higher (+16.732%) than our goal of 50% of students in BIOL 1010, BIOL 2250, and SCI 1020 scoring ≥70% on the quiz and higher (+8.88%) than the AC 2024-2025 (54.852%; 520/947). Based on the analysis of the 2024-2025 results, the director met with the Director of Institutional effectiveness and the decision was made to lower 80% goal to 50%. That is the new assessment goal is to have 50% of the students score ≥70% on the quiz assessment. Based on the analysis of these results, we see success with our students for SLO1.1 and SLO1.2 but still need enhanced instruction for our BIOL 2250 students as well as the individual parts of the scientific method with emphasis on the different aspects of the scientific method.

Decision or action to drive future improvement. Based on the analysis of the results from AC 2025-2026, in AC 2026-2027, we will implement the following changes to drive the cycle of continuous improvement:

- The Director of STEM will meet with the Director of Institutional Effectiveness to determine if we need to reduce the percentage based on the 2025-2026 assessment.

- The Director of STEM and Department Head of Biology and Microbiology will meet with all BIOL 1010, 2250, and SCI 1020 course stewards and instructors during on-call week to make sure they understand the assessment process and to check whether it is on the instructors Moodle page.

- Put emphasis on BIOL 2250 instructors to explain the scientific method and ensure they understand the assessment process.

- Based on the data we will increase instructional time on the different types of experimental variables, which is a difficult concept for many students.

SLO 2. Students will analyze scientific data to draw conclusions about the natural and physical world

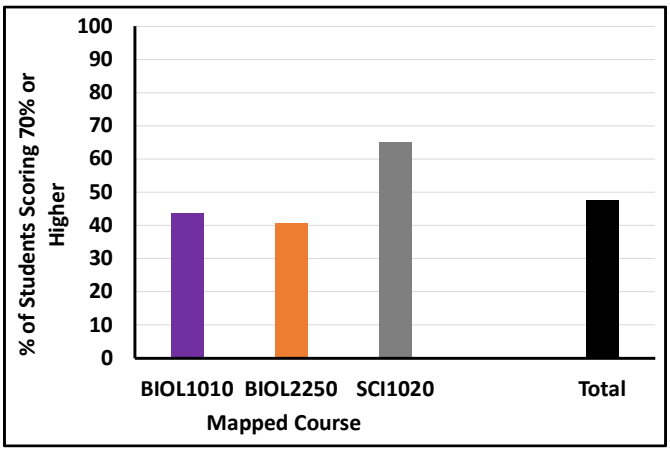
Measure 2.1. Students will demonstrate their ability to make experimental predictions.

Throughout the indicated courses, students will learn how to use their knowledge of the scientific method and experimental design to make predictions of experimental results. This will require the ability to interpret experimental design to use those interpretations to predict the results of the executed experiments. Each student is required to pass a quiz covering these concepts. The target is to have 50% of students attain a quiz grade of ≥70%.

AC 2025-2026 Assessment

Course Name	Methodology	Total students Assessed	Number above 70%	Target percentage	Term
BIOL 1010	Quiz	**368**	**161**	**43.75**	Fall and Spring
BIOL2250	Quiz	**417**	**169**	**40.528**	Fall and Spring
SCI1020	Quiz	**260**	**169**	**65**	Fall and Spring
Total		**1045**	**499**	**47.751**	

Finding. Target Not Met. 1045 Students assessed: 659 in Fall 2025 and 386 in Spring 2026; 205 dual enrollment students assessed: 103 in Fall 2024 and 102 in Spring 2025
Graph.



Measure 2.1 – Students will demonstrate their ability to make experimental predictions. Data from AC 2025 -2026.

Analysis. In AC 2017-2018, the natural sciences core competency consisted of a single student learning outcome with a single measure. The University modified its General Education Core Curriculum, ensuring that its six key competencies are central to the mission and are consistent with the Louisiana Board of Regents' requirements for general education. In response, the natural sciences' core competency was changed to the following: To understand the universe through the study of life and physical sciences. This new core competency has two different student learning outcomes, each with two different measures. New quiz-based assessments were designed and implemented for the first time during AC 2018-2019 and the target was lowered from 80% to 50% after the AC 2024-2025 assessment. In AC 2025-2026, the target was not met with 47.751% (499/1045) of students scoring 70% or higher on the quiz. This is lower (-2.249%) than our goal of 50% of students in BIOL 1010, BIOL 2250, and SCI 1020 scoring ≥70% on the quiz, but higher (+1.549%) than the AC 2024-2025 (46.202; 520/947). Based on the analysis of the 2024-2025 results, the director met with the Director of Institutional effectiveness and the decision was made to lower 80% goal to 50%. That is the new assessment goal is to have 50% of the students score ≥70% on the quiz assessment. Based on the analysis of these results,

we see success with our students for SLO 1.1 but still need enhanced instruction for our BIOL 2250 students as well as the individual parts of the scientific method with emphasis on the different aspects of the scientific method.

Decision or action to drive future improvement. Based on the analysis of the results from AC 2025-2026, in AC 2026-2027, we will implement the following changes to drive the cycle of continuous improvement:

- The Director of STEM will meet with the Director of Institutional Effectiveness to determine if we need to reduce the percentage based on the 2025-2026 assessment.
- The Director of STEM and Department Head of Biology and Microbiology will meet with all BIOL 1010, 2250, and SCI 1020 course stewards and instructors during on-call week to make sure they understand the assessment process and to check whether it is on the instructors Moodle page.
- Put emphasis on BIOL 2250 instructors to explain the scientific method and ensure they understand the assessment process.
- Based on the data we will increase instructional time on the different types of experimental variables, which is a difficult concept for many students.

Measure 2.2. Students will analyze scientific data to draw conclusions about the natural and physical world.

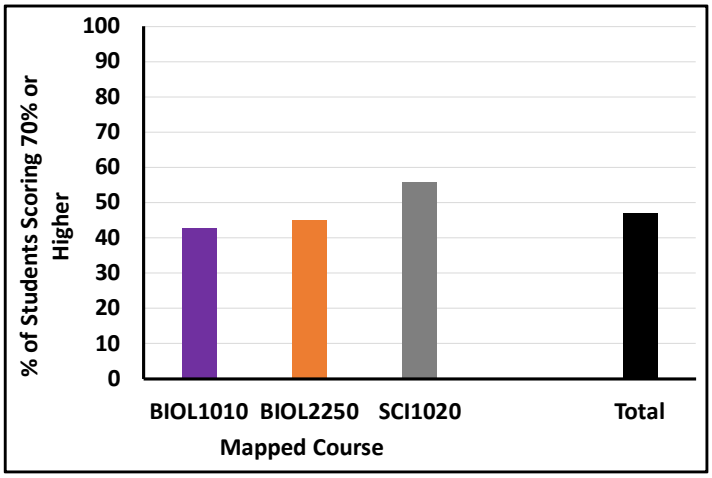
Throughout the indicated courses, students will learn how to use their knowledge of the scientific method and experimental design to analyze scientific data and to make conclusions based on that data analysis. This will require the ability to interpret scientific data presented in verbal, tabular, or graphic form then use those interpretations to provide scientific explanations for those results. Each student is required to pass a quiz covering these concepts. The target is to have 50% of students attain a quiz grade of ≥70%.

Course Name	Methodology	Total students Assessed	Number above 70%	Target percentage	Term
BIOL 1010	Quiz	**368**	**157**	**42.663**	Fall and Spring
BIOL2250	Quiz	**417**	**188**	**45.084**	Fall and Spring
SCI1020	Quiz	**260**	**145**	**55.769**	Fall and Spring
Total		**1045**	**490**	**46.89**	

AC 2025-2026 Assessment

Finding. Target Not Met. 1045 Students assessed: 659 in Fall 2025 and 386 in Spring 2026; 205 dual enrollment students assessed: 103 in Fall 2024 and 102 in Spring 2025

Graph.



Measure 2.2 – Students will analyze scientific data to draw conclusions about the natural and physical world. Data collected from AC 2025 - 2026.

Analysis. In AC 2017-2018, the natural sciences core competency consisted of a single student learning outcome with a single measure. The University modified its General Education Core Curriculum, ensuring that its six key competencies are central to the mission and are consistent with the Louisiana Board of Regents' requirements for general education. In response, the natural sciences' core competency was changed to the following: To understand the universe through the study of life and physical sciences. This new core competency has two different student learning outcomes, each with two different measures. New quiz-based assessments were designed and implemented for the first time during AC 2018-2019 and the target was lowered from 80% to 70% after the AC 2024-2025 assessment. In AC 2025-2026, the target was not met with 46.89% (490/1045) of students scoring 50% or higher on the quiz. This is lower (-3.11%) than our goal of 50% of students in BIOL 1010, BIOL 2250, and SCI 1020 scoring ≥70% on the quiz, but higher (+6.7%) than the AC 2024-2025 (40.19; 381/947). Based on the analysis of the 2024-2025 results, the director met with the Director of Institutional effectiveness and the decision was made to lower 80% goal to 50%. That is the new assessment goal is to have 70% of the students score ≥70% on the quiz assessment. Based on the analysis of these results, we see success with our students for SLO 1.1 and 1.2 but still need enhanced instruction for our BIOL 2250 students as well as the individual parts of the scientific method with emphasis on the different aspects of the scientific method.

Decision or action to drive future improvement. Based on the analysis of the results from AC 2025-2026, in AC 2026-2027, we will implement the following changes to drive

the cycle of continuous improvement:

- The Director of STEM will meet with the Director of Institutional Effectiveness to determine if we need to reduce the percentage based on the 2025-2026 assessment.

- The Director of STEM and Department Head of Biology and Microbiology will meet with all BIOL 1010, 2250, and SCI 1020 course stewards and instructors during on-call week to make sure they understand the assessment process and to check whether it is on the instructors Moodle page.

- Put emphasis on BIOL 2250 instructors to explain the scientific method and ensure they understand the assessment process.

- Based on the data we will increase instructional time on the different types of experimental variables, which is a difficult concept for many students.

Comprehensive Summary of Key Evidence of improvement based on the analysis of results. Based on the analysis of the assessment results from AC 2024 – 2025 year, the director and instructors of the indicated courses made the following adjustments to increase student performance based in 2025-2026:

- The Director of STEM met with the Director of Institutional Effectiveness and a decision was made to lower the 80% goal to 50%.
- The director met with the faculty and discussed a new plan to elucidate the scientific method and improve student performance.
- Instruction was enhanced for each individual part of the scientific method with emphasis on the different aspects of the scientific method
- The timing of the assessment was discussed and delivered directly after discussion of the scientific method in class.
- Instructors implemented a practice scientific method exam and reviewed the practice test prior to taking the actual assessment.

The implementation of these changes resulted in improvements in student performance for measures 1.1 (-7.374%) and 1.2 (+8.87%) for which we met the new 50% target for both measures. We met increased, 2.1 (+1.548%), and 2.2 (+6.67%) from AC 2024 – 2025 to AC 2025 – 2026 but still did not meet the new 50% target.

Plan of action moving forward. Based on the analysis of the results in AC 2025-2026, in AC 2026-2027, we will implement the following changes to drive the cycle of continuous improvement:

- The Director of STEM and Department Head of Biology and Microbiology will meet with the course stewards for BIOL 1010, 2250, and SCI 1020 prior to the AC 2026 – 2027 assessment cycle and will make sure the instructors

understand the assessment process

- Course Stewards will check the respective Moodle shells to ensure the scientific method quiz and practice assessments are available, that dates, attempts, and scores are correct prior to the start of the semester.
- Increase instructional time on the parts of the scientific method.
- Focus more instructional time on
    - the different types of experimental variables
    - how those variables are used in proper experimental design
    - the analysis of scientific data with focus on the understanding of tabular and graphical representations of data