Assessment Cycle 2024-2025

Mathematics – Core Competency #2

To apply mathematical and analytical reasoning skills.

Prepared by: Zeb Marcotte **Date: May 23, 2025**

Approved by: Dr. Greg Handel, Provost **Date: May 24, 2025**

Northwestern Mission

Northwestern State University is a responsive, student-oriented institution committed to acquiring, creating, and disseminating knowledge through innovative teaching, research, and service. With its certificate, undergraduate, and graduate programs, Northwestern State University prepares its increasingly diverse student population to contribute to an inclusive global community with a steadfast dedication to improving our region, state, and nation.

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

(1) Students must complete one of the following Core sequences:

Course Name - Sequence	Methodology	Target	Term
Math 1020 & 1060	Quiz	80%	Fall & Spring
Math 1035 & 1060	Quiz	80%	Fall & Spring
Math 1020 & 1090	Quiz	80%	Fall & Spring
Math 1020 & 2010	Quiz	80%	Fall & Spring
Math 1820 & 1830	Quiz	80%	Fall & Spring
Math 2100 & 2110	Quiz	80%	Fall & Spring

The first four sequences are offered online as well as face-to-face. The last two are only taught face-to-face at the Natchitoches campus.

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We will administer a quiz near the end of each core class according to the schedule below. If the course is taught online, we will administer this quiz through Moodle or My Math Lab whether the class is an online section or not. The following table shows the semester in which the quiz is administered.

Course Name	Administration Semester
Math 1020	Fall
Math 1035	Fall
Math 1060	Spring
Math 1090	Spring
Math 2010	Spring
Math 1810	Fall and Spring
Math 2100	Fall and Spring
Math 2110	Fall and Spring

(2) Data from the assessment tools (direct & indirect quantitative & qualitative) are collected and returned to the executive director at the end of each term indicated (see Student Learning Outcomes section, below, for details).
(3) The executive director will analyze the data to determine whether applicable outcomes are met.
(4) Results from the assessment will be discussed with the appropriate staff members.
(5) The executive director, in consultation with the staff and senior leadership, will determine proposed changes to measurable outcomes and assessment tools for the next assessment period, and, if needed, service changes.

Student Learning Outcomes (SLO)

SLO 1: Students will apply mathematics/analytical reasoning skills by translating a word problem into an appropriate mathematical model and translating the solution of a model into an answer to a practical problem.

Measure 1.1 Methodology: Direct Measure – Quiz administered in each class. Target: 90% of students will attain a score of 2 (Acceptable) on the questions that ask the student to pick an appropriate mathematical model for a problem. Further, in each course, at least 80% of students will attain a score of 2.

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Course Name	Methodology	Target	Term
Math 1020	Quiz	80%	Fall
Math 1035	Quiz	80%	Fall
Math 1060	Quiz	80%	Spring
Math 1090	Quiz	80%	Spring
Math 2010	Quiz	80%	Spring
Math 1820	Quiz	80%	Fall and Spring
Math 1830	Quiz	80%	Fall and Spring
Math 2100	Quiz	80%	Fall and Spring
Math 2110	Quiz	80%	Fall and Spring

Finding: Target not met.

Analysis: **In AC 2023-2024, the target was not met**. Overall, 1112 students were assessed (of which 72 were Dual Enrollment); 1071 met the target score or better. 96.3% of students reached the assessment goal.

Course Name	Total Number of Students Assessed	Total Number of Students Meeting Target	% Meeting Target
Math 1020	532	521	97.9
Math 1035	108	103	95.4
Math 1060	368	348	94.6
Math 1090	56	55	98.2
Math 2010	26	24	92.0
Math 1810	3	2	66.7
Math 2100	6	6	100.0
Math 2110	13	12	92.3

Based on the analysis of the AC 2023-2024 results and to drive further improvement, the following changes were implemented for AC 2024-2025:

- Course coordinators ensured that all instructors received the assessment during the first week of class to align class materials and instruction.
- Typically, the assessment had been administered towards the end of the last week of class. However, student participation had declined. Therefore, to increase student participation, the assessment was made available to students once all class material had been covered.
- We have had varying success in Math 1810 for the last few years. In the Fall of 2024, Math 1810 was split into two 3-credit hour courses, Math 1820 and 1830. In addition, a

corequisite course was offered in concurrence with 1820 to provide supplemental instruction for students with Math ACT scores of 18 and below.

- Prior to unit exams, instructor-led reviews were conducted for the benefit of the student, with a particular focus on mathematical models.

As a result, the target was not met for AC 2024-2025. The following data was found: Overall, 1198 students were assessed (of which 131 were Dual Enrollment); 1169 met the target score or better. 97.6% of students reached the assessment goal.

Course Name	Total Number of Students Assessed	Total Number of Students Meeting Target	% Meeting Target
Math 1020	553	551	99.6%
Math 1035	66	56	84.8%
Math 1060	426	417	97.9%
Math 1090	75	75	100.0%
Math 2010	43	40	93.0%
Math 1820	1	1	100.0%
Math 1830	7	7	100.0%
Math 2100	23	18	78.3%
Math 2110	4	4	100.0%

The overall target of 90% success was met. Only one class (Math 2100) did not achieve the individual course goals of 80% success. **If one additional student in Math 2100 had attained an acceptable score, the target would have been met.** We saw meaningful improvement in Math 1820 and 1830, which were two 3-credit hour courses created from the 6-credit hour course, Math 1810. It should be noted, only one student was assessed in 1820. Four courses achieved 100% success, including Math 1090, a first for the class. Math 1035 dropped due to a course restructure (new book, new material).

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

- The Course Coordinator for MATH 1035 will conduct a review of the quiz to ensure alignment with the stated academic standards. Additionally, the Course Coordinator will convene a meeting with all MATH 1035 instructors during the designated on-call week to discuss the course curriculum and outline.
- Faculty will select 3-5 student responses from the Assessment Quiz and conduct a microanalysis – a step-by-step breakdown of where students succeeded or struggled. These findings will be shared during department meetings along with a suggestion for instructional changes based on what the analysis reveals.

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- Instructors will collaborate to develop and implement a standardized problem-solving strategy. This strategy will emphasize restating the problem in one's own words, identifying known and unknown variables, and determining appropriate next steps within the context of the problem.

Measure 1.2 Methodology: Direct Measure – Quiz administered in each class. Target: 80% of students will attain a score of 2 (Acceptable) on questions that ask the student to interpret the solution to a mathematical model as an answer to a practical problem. Further, in each course, at least 80% of students will attain a score of 2.

Course Name	Methodology	Target	Term
Math 1020	Quiz	80%	Fall
Math 1035	Quiz	80%	Fall
Math 1060	Quiz	80%	Spring
Math 1090	Quiz	80%	Spring
Math 2010	Quiz	80%	Spring
Math 1820	Quiz	80%	Fall and Spring
Math 1830	Quiz	80%	Fall and Spring
Math 2100	Quiz	80%	Fall and Spring
Math 2110	Quiz	80%	Fall and Spring

Finding: Target not met.

Analysis: In AC 2023-2024 the target was not met. Overall, 1112 students were assessed (of which 72 were Dual Enrollment); 1072 met the target score or better. 96.4% of students reached the assessment goal.

Course Name	Total Number of Students Assessed	Total Number of Students Meeting Target	% Meeting Target
Math 1020	532	516	97.0
Math 1035	108	99	91.6
Math 1060	368	363	98.6
Math 1090	56	54	96.4
Math 2010	26	23	88.0
Math 1810	3	2	66.7
Math 2100	6	5	83.3
Math 2110	13	10	76.9

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Based on the analysis of the AC 2023-2024 results and to drive further improvement, the following changes were implemented for AC 2024-2025:

- Course coordinators ensured that all instructors received the assessment during the first week of class to align class materials and instruction.
- Typically, the assessment had been administered towards the end of the last week of class. However, student participation had declined. Therefore, to increase student participation, the assessment was made available to students once all class material had been covered.
- We have had varying success in Math 1810 for the last few years. In the Fall of 2024, Math 1810 was split into two 3-credit hour courses, Math 1820 and 1830. In addition, a corequisite course was offered in concurrence with 1820 to provide supplemental instruction for students with Math ACT scores of 18 and below.
- Prior to unit exams, instructor-led reviews were conducted for the benefit of the student, with a particular focus on interpreting solutions to mathematical models.

As a result, the target was not met for AC 2024-2025. The following data was found: Overall, 1199 students were assessed (of which 131 were Dual Enrollment); 1175 met the target score or better. 98.0% of students reached the assessment goal.

Course Name	Total Number of Students Assessed	Total Number of Students Meeting Target	% Meeting Target
Math 1020	553	549	99.3%
Math 1035	66	57	86.4%
Math 1060	427	426	99.8%
Math 1090	75	75	100.0%
Math 2010	43	39	90.7%
Math 1820	1	1	100.0%
Math 1830	7	7	100.0%
Math 2100	23	17	73.9%
Math 2110	4	4	100.0%

The overall target of 80% success was met. We again saw meaningful improvement in Math 1820 and 1830, which were two 3-credit hour courses created from the 6-credit hour course, Math 1810. It should be noted, only one student was assessed in 1820. Four courses achieved 100% success, including Math 1090, a first for the class. Math 1035 dropped significantly due to a course restructure (new book, new material). **If two additional students in Math 2100 had attained an acceptable score, the target would have been met.**

Assessment Cycle 2024-2025

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

- The Course Coordinator for MATH 1035 will conduct a review of the quiz to ensure alignment with the stated academic standards. Additionally, the Course Coordinator will convene a meeting with all MATH 1035 instructors during the designated on-call week to discuss the course curriculum and outline.
- Faculty will select 3-5 student responses from the Assessment Quiz and conduct a microanalysis – a step-by-step breakdown of where students succeeded or struggled. These findings will be shared during department meetings along with a suggestion for instructional changes based on what the analysis reveals.
- Instructors will collaborate to develop and implement a standardized problem-solving strategy. This strategy will emphasize restating the problem in one's own words, identifying known and unknown variables, and determining appropriate next steps within the context of the problem.

SLO 2: Students will demonstrate the ability to solve a mathematical problem through algebraic, graphical/geometrical, or numerical/statistical methods as appropriate.

Measure 2.1 Methodology: Direct measure – Quiz administered in each class. Target: 95% of students will attain a score of 2 (Acceptable) on the questions that ask a student to solve a problem stated in mathematical symbology. Further, in each course, at least 80% of students will attain a score of 2.

Course Name	Methodology	Target	Term
Math 1020	Quiz	80%	Fall
Math 1035	Quiz	80%	Fall
Math 1060	Quiz	80%	Spring
Math 1090	Quiz	80%	Spring
Math 2010	Quiz	80%	Spring
Math 1820	Quiz	80%	Fall and Spring
Math 1830	Quiz	80%	Fall and Spring
Math 2100	Quiz	80%	Fall and Spring
Math 2110	Quiz	80%	Fall and Spring

Finding: Target not met.

Analysis: **In the AC 2023-2024, the target was not met.** Overall, 1112 students were assessed (of which 72 were Dual Enrollment); 1083 met the target score or better. 97.4% of students reached the assessment goal.

Assessment Cycle 2024-2025

Course Name	Total Number of Students Assessed	Total Number of Students Meeting Target	% Meeting Target
Math 1020	532	528	99.2
Math 1035	108	101	93.5
Math 1060	368	364	98.9
Math 1090	56	51	91.1
Math 2010	26	21	81.0
Math 1810	3	2	66.7
Math 2100	6	6	100.0
Math 2110	13	10	76.9

Based on the analysis of the AC 2023-2024 results and to drive further improvement, the following changes were implemented for the AC 2024-2025:

- Course coordinators ensured that all instructors received the assessment during the first week of class to align class materials and instruction.
- Typically, the assessment had been administered towards the end of the last week of class. However, student participation had declined. Therefore, to increase student participation, the assessment was made available to students once all class material had been covered.
- We have had varying success in Math 1810 for the last few years. In the Fall of 2024, Math 1810 was split into two 3-credit hour courses, Math 1820 and 1830. In addition, a corequisite course was offered in concurrence with 1820 to provide supplemental instruction for students with Math ACT scores of 18 and below.
- Prior to unit exams, instructor-led reviews were conducted for the benefit of the student, with particular focus on problem solving when given mathematical symbology.

As a result, the target was not met for AC 2024-2025. The following data was found: Overall, 1199 students were assessed (of which 131 were Dual Enrollment); 1175 met the target score or better. 98.0% of students reached the assessment goal.

Assessment Cycle 2024-2025

Course Name	Total Number of Students Assessed	Total Number of Students Meeting Target	% Meeting Target
Math 1020	553	548	99.1%
Math 1035	66	55	83.3%
Math 1060	427	426	99.8%
Math 1090	75	74	98.7%
Math 2010	43	40	93.0%
Math 1820	1	1	100.0%
Math 1830	7	7	100.0%
Math 2100	23	21	91.3%
Math 2110	4	3	75.0%

The overall target of 95% success was met. **Only one class (Math 2110) did not achieve the individual course goals of 80% success. If one additional student in Math 2110 had attained an acceptable score, the target would have been met. In addition, this course only saw 4 students assessed.** We saw meaningful improvement in Math 1820 and 1830, which were two 3-credit hour courses created from the 6-credit hour course, Math 1810. It should be noted, only one student was assessed in 1820. Math 1035 dropped due to a course restructure (new book, new material).

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

- The Course Coordinator for MATH 1035 will conduct a review of the quiz to ensure alignment with the stated academic standards. Additionally, the Course Coordinator will convene a meeting with all MATH 1035 instructors during the designated on-call week to discuss the course curriculum and outline.
- Faculty will select 3-5 student responses from the Assessment Quiz and conduct a microanalysis – a step-by-step breakdown of where students succeeded or struggled. These findings will be shared during department meetings along with a suggestion for instructional changes based on what the analysis reveals.
- Instructors will collaborate to develop and implement a standardized problem-solving strategy. This strategy will emphasize restating the problem in one's own words, identifying known and unknown variables, and determining appropriate next steps within the context of the problem.

Measure 2.2 Methodology: Direct measure – Quiz administered in each class. Target: 90% of students will attain a score of 2 (Acceptable) on the questions that ask a student to solve a word problem. Further, in each course, at least 80% of students will attain a score of 2.

Assessment Cycle 2024-2025

Course Name	Methodology	Target	Term
Math 1020	Quiz	80%	Fall
Math 1035	Quiz	80%	Fall
Math 1060	Quiz	80%	Spring
Math 1090	Quiz	80%	Spring
Math 2010	Quiz	80%	Spring
Math 1820	Quiz	80%	Fall and Spring
Math 1830	Quiz	80%	Fall and Spring
Math 2100	Quiz	80%	Fall and Spring
Math 2110	Quiz	80%	Fall and Spring

Finding: Target not met.

Analysis: **In the AC 2023-2024 the target was not met.** Overall, 1112 students were assessed (of which 72 were Dual Enrollment); 1040 met the target score or better. 93.5% of students reached the assessment goal.

Course Name	Total Number of Students Assessed	Total Number of Students Meeting Target	% Meeting Target
Math 1020	532	520	97.7
Math 1035	108	92	85.1
Math 1060	368	350	95.1
Math 1090	56	43	76.7
Math 2010	26	20	77.0
Math 1810	3	1	33.0
Math 2100	6	4	66.6
Math 2110	13	10	76.9

Based on the analysis of the AC 2023-2024 results and to drive further improvement, the following changes were implemented for the AC 2024-2025:

- Course coordinators ensured that all instructors received the assessment during the first week of class to align class materials and instruction.
- Typically, the assessment had been administered towards the end of the last week of class. However, student participation had declined. Therefore, to increase student participation, the assessment was made available to students once all class material had been covered.
- We have had varying success in Math 1810 for the last few years. In the Fall of 2024, Math 1810 was split into two 3-credit hour courses, Math 1820 and 1830. In addition, a

corequisite course was offered in concurrence with 1820 to provide supplemental instruction for students with Math ACT scores of 18 and below.

- Prior to unit exams, instructor-led reviews were conducted for the benefit of the student, with a particular focus on solving word problems.

As a result, the target was not met for AC 2024-2025. The following data was found: Overall, 1199 students were assessed (of which 131 were Dual Enrollment); 1157 met the target score or better. 96.5% of students reached the assessment goal.

Course Name	Total Number of Students Assessed	Total Number of Students Meeting Target	% Meeting Target
Math 1020	553	544	98.4%
Math 1035	66	50	75.8%
Math 1060	427	422	98.8%
Math 1090	75	72	96.0%
Math 2010	43	39	90.7%
Math 1820	1	1	100.0%
Math 1830	7	7	100.0%
Math 2100	23	18	78.3%
Math 2110	4	4	100.0%

The overall target of 90% success was met. Solving a word problem has been a particular challenge and an intense area of focus over the last several years. The efforts we have undertaken and strategies we have implemented have been successful in this area. In AC 2020-2021, our overall success in this measure was 68.7%. In AC 2024-2025, we achieved the highest success rate yet at 96.5%. Only two classes, Math 1035 and Math 2100, did not achieve the individual course goals of 80% success. **If one additional student in Math 2100 and three additional students in Math 1035 had attained an acceptable score, the target would have been met.** We saw meaningful improvement in Math 1820 and 1830, which were two 3-credit hour courses created from the 6-credit hour course, Math 1810. It should be noted, only one student was assessed in 1820. Math 1035 dropped due to a course restructure (new book, new material).

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

- The Course Coordinator for MATH 1035 will conduct a review of the quiz to ensure alignment with the stated academic standards. Additionally, the Course Coordinator will convene a meeting with all MATH 1035 instructors during the designated on-call week to discuss the course curriculum and outline.

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- Faculty will select 3-5 student responses from the Assessment Quiz and conduct a microanalysis – a step-by-step breakdown of where students succeeded or struggled. These findings will be shared during department meetings along with a suggestion for instructional changes based on what the analysis reveals.
- Instructors will collaborate to develop and implement a standardized problem-solving strategy. This strategy will emphasize restating the problem in one's own words, identifying known and unknown variables, and determining appropriate next steps within the context of the problem.

Comprehensive Summary of Key Evidence of Improvement Based on Analysis of Results.
We are pleased to report that the mathematics department, overall, was able to meet the goal for each respective measure in which students were assessed over AC 2024-2025. That is, the target was met when the data was considered comprehensively. However, in some instances, individual courses did not meet their intended target. Our work over the last couple of years to drive improvement on solving word problems has been incredibly successful as we reached a record high on overall success at 96.5%

The following reflects all the changes implemented in AC 2024-2025 to drive the continuous process of seeking improvement. The changes are based on the knowledge gained through the analysis of the AC 2023-2024 results.

SLO1.

Measure 1.1

- Course coordinators ensured that all instructors received the assessment during the first week of class to align class materials and instruction.
- Typically, the assessment had been administered towards the end of the last week of class. However, student participation had declined. Therefore, to increase student participation, the assessment was made available to students once all class material had been covered.
- We have had varying success in Math 1810 for the last few years. In the Fall of 2024, Math 1810 was split into two 3-credit hour courses, Math 1820 and 1830. In addition, a corequisite course was offered in concurrence with 1820 to provide supplemental instruction for students with Math ACT scores of 18 and below.
- Prior to unit exams, instructor-led reviews were conducted for the benefit of the student, with a particular focus on mathematical models.

Measure 1.2

- Course coordinators ensured that all instructors received the assessment during the first week of class to align class materials and instruction.

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- Typically, the assessment had been administered towards the end of the last week of class. However, student participation had declined. Therefore, to increase student participation, the assessment was made available to students once all class material had been covered.
- We have had varying success in Math 1810 for the last few years. In the Fall of 2024, Math 1810 was split into two 3-credit hour courses, Math 1820 and 1830. In addition, a corequisite course was offered in concurrence with 1820 to provide supplemental instruction for students with Math ACT scores of 18 and below.
- Prior to unit exams, instructor-led reviews were conducted for the benefit of the student, with a particular focus on interpreting solutions to mathematical models.

SLO2.

Measure 2.1

- Course coordinators ensured that all instructors received the assessment during the first week of class to align class materials and instruction.
- Typically, the assessment had been administered towards the end of the last week of class. However, student participation had declined. Therefore, to increase student participation, the assessment was made available to students once all class material had been covered.
- We have had varying success in Math 1810 for the last few years. In the Fall of 2024, Math 1810 was split into two 3-credit hour courses, Math 1820 and 1830. In addition, a corequisite course was offered in concurrence with 1820 to provide supplemental instruction for students with Math ACT scores of 18 and below.
- Prior to unit exams, instructor-led reviews were conducted for the benefit of the student, with particular focus on problem solving when given mathematical symbology.

Measure 2.2

- Course coordinators ensured that all instructors received the assessment during the first week of class to align class materials and instruction.
- Typically, the assessment had been administered towards the end of the last week of class. However, student participation had declined. Therefore, to increase student participation, the assessment was made available to students once all class material had been covered.
- We have had varying success in Math 1810 for the last few years. In the Fall of 2024, Math 1810 was split into two 3-credit hour courses, Math 1820 and 1830. In addition, a corequisite course was offered in concurrence with 1820 to provide supplemental instruction for students with Math ACT scores of 18 and below.

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- Prior to unit exams, instructor-led reviews were conducted for the benefit of the student, with a particular focus on solving word problems.

Plan of action moving forward. Target success will remain the same for each measure since the individual class goals were not met during this academic year. Overall, to drive the cycle of improvement, we will implement the following changes:

- The Course Coordinator for MATH 1035 will conduct a review of the quiz to ensure alignment with the stated academic standards. Additionally, the Course Coordinator will convene a meeting with all MATH 1035 instructors during the designated on-call week to discuss the course curriculum and outline.
- Faculty will select 3-5 student responses from the Assessment Quiz and conduct a microanalysis – a step-by-step breakdown of where students succeeded or struggled. These findings will be shared during department meetings along with a suggestion for instructional changes based on what the analysis reveals.
- Instructors will collaborate to develop and implement a standardized problem-solving strategy. This strategy will emphasize restating the problem in one's own words, identifying known and unknown variables, and determining appropriate next steps within the context of the problem.