

## Mission

The Biology Department has three missions: 1. We seek to produce graduates with a broad-based knowledge of biology and the capacity to apply their education in critically evaluating emerging scientific knowledge. 2. The department is committed to providing research opportunities for faculty, undergraduate and graduate students as part of its broader educational mission. 3. The Biology department provides courses that fulfill laboratory science requirements for many other degrees and for the university core curriculum.

Academic year 2024-2025

BS in Biology - BS-BIOL Learning Outcomes

Knowledge of fundamental principles of Biology

MEASURES	RESULTS	ACTIONS
<p><b>National average ranking</b></p> <p>Direct - Other</p> <p><b>Target</b></p> <p>At least 50% of Lamar biology students will score at or above the national average for total exam score on the ETS Major Field Exam in Biology.</p>	<p><b>NOT MET</b></p> <p><b>Summary</b></p> <p>Lamar Biology did not meet expectations on the overall performance on the ETS_MFE with 39.4% of students (n = 33) scoring at or above the national mean.</p> <p><a href="#">assessment data24-25 outcome 1.xlsx</a></p> <p><b>Analysis</b></p> <p>A total of 33 students took the Biology MFE exam with not quite 40% our students scoring at or above the national average for the year, which is not a desirable result. However, if we break the data down by semester a different story emerges. There was a larger cohort (n= 20) in the fall semester, but scores were very low, with only 25% of the students scoring at the desired level and 50% scoring <math>\leq 20\%</math>. The spring cohort (n = 13) performed much better with 61.5% scoring at the desired level and only 15% scoring <math>\leq 20\%</math>.</p> <p>Another factor that may play a role in student performance is the timing of when they take the exam. It was noted that several of the students taking the exam had not completed courses in some of the subject areas.</p>	<p><b>Modify Policies / Procedures</b></p> <p>Not Started</p> <p>One of the topics discussed in the past is student apathy towards the test. There were no real consequences for them if they did not perform well and not all students took the exam. Taking the exam was made part of the grade for BIOL 4344, the senior capstone class. This helped to boost scores for a while, but scores appear to be on the decline again. The instructor is revising the grading scheme for the course to include including tying more of the overall course grade to exam performance.</p> <p>The department will also discuss the possibilities of adding additional pre-requisites to the course to prevent students from taking the exam too early in their degree. Current requirements are senior standing and genetics. Many students are classified as seniors due to total credit hours, however, have had minimal biology coursework. Information provided during advising session will also stress the importance of taking the capstone class at the appropriate time.</p> <p>Recommended Due Date: 05/29/2026</p>
<p><b>Number in the 50th percentile</b></p> <p>Direct - Other</p> <p><b>Target</b></p> <p>At least 50% of Lamar biology students will score at or above the 50th percentile nationally for total exam score.</p>	<p><b>NOT MET</b></p> <p><b>Summary</b></p> <p>Lamar Biology did not meet expectations on the overall performance on the ETS_MFE with 39.4 % of students scoring at or above the 50<sup>th</sup> percentile.</p> <p><a href="#">assessment data24-25 outcome 1.xlsx</a></p> <p><b>Analysis</b></p> <p>A total of 33 students took the Biology MFE exam with not quite 40% our students scoring in the 50% percentile or above which is not a desirable result. However, if we break the data down by</p>	<p><b>Modify Policies / Procedures</b></p> <p>Not Started</p> <p>One of the topics discussed in the past is student apathy towards the test. There were no real consequences for them if they did not perform well and not all students took the exam. Taking the exam was made part of the grade for BIOL 4344, the senior capstone class. This helped to boost scores for a while, but scores appear to be on the decline again. The instructor is revising the grading scheme for the course to include including tying more of the overall course grade to exam performance.</p> <p>The department will also discuss the possibilities of adding additional pre-requisites to the course to prevent students</p>

	<p>semester a different story emerges.</p> <p>There was a larger cohort (n= 20) in the fall semester, but scores were very low, with only 25% of the students scoring at the desired level and 50% scoring <math>\leq 20\%</math>. The spring cohort (n = 13) performed much better with 61.5% scoring at the desired level and only 15% scoring <math>\leq 20\%</math>.</p>	<p>from taking the exam too early in their degree. Current requirements are senior standing and genetics. Many students are classified as seniors due to total credit hours, however, have had minimal biology coursework. Information provided during advising session will also stress the importance of taking the capstone class at the appropriate time.</p> <p>Recommended Due Date: 05/29/2026</p>
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## Knowledge of Cell Biology

MEASURES	RESULTS	ACTIONS
<p><b>National average comparison</b></p> <p>Direct - Other</p> <p><b>Target</b></p> <p>At least 50% of Lamar biology students will score at or above the national average for the Cell Biology subscore and the Biochemistry and Cell Energetics and Cellular Structure, Organization, and Function assessment indicators.</p>	<p><b>NOT MET</b></p> <p><b>Summary</b></p> <p>Lamar Biology did not meet expectations for 50% of students scoring at or above the national average for <i>Cell Biology</i> subscore (36.4%) and the <i>Biochemistry and Cell Energetics</i> (39.4%) and <i>Cellular Structure, Organization, and Function</i> (33.3%) assessment indicators. However, the mean for Lamar students on the Assessment indicator for <i>Biochemistry and Cell Energetics</i> was the same as the national mean, indicating that our students as a cohort are on par with their peers in this area.</p> <p><a href="#">assessment data 24-25_outcome 2.xlsx</a></p> <p><b>Analysis</b></p> <p><i>Cell biology, Biochemistry &amp; Cellular energetics, and Cellular structure, organization and function</i> have historically been weak areas of performance for Lamar students. Our current action plan to address this issue was implemented during the 22-23 reporting cycle and included major revisions to the instructional units of 1406 that covered these topics. As this is an entry level course and the students taking the MFE are seniors, there has been insufficient time for the results of these improvements to be fully realized. One piece of evidence that indicates that revisions are having the desired effects is by examining the data by fall and spring cohorts. The institutional means of the spring cohort for these metrics are well above the national mean and the overall Lamar mean for the assessment indicator was the same as the national mean. This information would be reinforced in BIOL 4470 Cell Biology however, not all students enroll in the course. It is one of two classes that can be used to fulfill the cell/molecular component. The other course BIOL 4404 Molecular biology places little emphasis on these topics and</p>	<p><b>Revise Benchmark / Target</b></p> <p><b>Not Started</b></p> <p>We will decrease the percent of students meeting or exceeding the national average from 50 % to 46% for both the subscore and assessment indicators.</p> <p>Efforts will continue in tracking the performance of students who have been through BIOL4470 Cell biology on this section of the MFE. Additional efforts will be made to track the timing of the course in relation to the test. Recent hires in the department include expertise in cell &amp; molecular so that we will be able to offer a wider variety of cell related courses which may help to improve scores.</p> <p>Recommended Due Date: 05/29/2026</p>

	is covered by a different area of the test. Of the students doing poorly on these metrics the large majority did not take BIOL4470 (70%).	
<b>50th percentile score</b>  Direct - Other  <b>Target</b>  At least 50% of Lamar biology students will score at or above the 50th percentile nationally for the Cell Biology subscore and the Biochemistry and Cell Energetics and Cellular Structure, Organization, and Function assessment indicators.	<b>NOT MET</b> <b>Summary</b>  Lamar Biology did not meet expectations for students scoring at the 50 <sup>th</sup> percentile or higher for the <i>Cell biology</i> subscore (39.4%), <i>Biochemistry and Cell Energetics</i> (39.4%) and <i>Cellular Structure, Organization, and Function</i> (27.3%) assessment indicators. <a href="#">assessment data 24-25_outcome 2.xlsx</a>  <b>Analysis</b>  <i>Cell biology, Biochemistry &amp; Cellular energetics, and Cellular structure, organization and function</i> have historically been weak areas of performance for Lamar students. Our current action plan to address this issue was implemented during the 22-23 reporting cycle and included major revisions to the instructional units of 1406 that covered these topics. As this is an entry level course and the students taking the MFE are seniors, there has been insufficient time for the results of these improvements to be fully realized. One piece of evidence that indicates that revisions are having the desired effects is by examining the data by fall and spring cohorts. The institutional means of the spring cohort for these metrics are well above the national mean. This information would be reinforced in BIOL 4470 Cell Biology however, not all students enroll in the course. It is one of two classes that can be used to fulfill the cell/molecular component. The other course BIOL 4404 Molecular biology places little emphasis on these topics and is assessed by another area of the test. Of the students doing poorly on these metrics the large majority did not take BIOL4470 (70%).	<b>Revise Benchmark / Target</b> Not Started  We will decrease the percentile that 50% of our students need to score at from 50th to 46th percentile on the subscore and assessment indicators for this section. Efforts will continue in tracking the performance of students who have been through BIOL4470 Cell biology on this section of the MFE. Additional efforts will be made to track the timing of the course in relation to the test. Recent hires in the department include expertise in cell & molecular meaning that we will be able to increase our elective offerings related to cellular biology. This should help increase the scores in the future by exposing more student to the topic.  Recommended Due Date: 05/29/2026

## Knowledge of Molecular biology &amp; Genetics

MEASURES	RESULTS	ACTIONS
<b>National average comparison</b>  Direct - Other  <b>Target</b>	<b>NOT MET</b> <b>Summary</b>  Lamar Biology did not meet expectations for 50% of students scoring at or higher than the national average for the <i>Molecular Biology and Genetics</i> subscore	<b>Maintain Assessment Strategy</b>  This is an area that is typically strong for us. The department hired a new genetics instructor who will start in fall 2025. As the course is their primary focus, the students should benefit from the increased attention. One of the additional hires made for the fall

<p>At least 50% of Lamar biology students will score at or above the national average for the Molecular Biology and Genetics subscore and the Molecular Biology and Molecular Genetics assessment indicator.</p>	<p>(45.5%) and the <i>Molecular Biology and Molecular Genetics</i> assessment indicator (45.5%).</p> <p><a href="#">assessment data 24-25_outcome 3.xlsx</a></p> <p><b>Analysis</b></p> <p>This area has historically been strong, partly due to many of the students being co-enrolled in genetics at the time of the exam. Also more students take molecular biology for their cell/molecular component, further strengthening performance on this section. While not meeting expectations, this area was still one of the stronger sections of this year's test. The department lost its genetics instructor early in the spring 24 semester which resulted in emergency teaching efforts to complete the course. Genetics in the fall 24 semester was taught by the cell biology instructor with little time to prepare the course before the semester start due to a failed summer search. This may have contributed to poor performance particularly in the fall cohort. As with the overall score and the cellular sections, the spring cohort scored higher than the national average on these sections.</p>	<p>also has experience in teaching genetics so will be able to contribute to the building of a strong course as well as providing a "back-up" instructor if the need arises.</p>
<p><b>50th percentile numbers</b></p> <p>Direct - Other</p> <p><b>Target</b></p> <p>At least 50% of Lamar biology students will score at or above the 50th percentile nationally for the Molecular Biology and Genetics subscore and the Molecular Biology and Molecular Genetics assessment indicator.</p>	<p><b>NOT MET</b></p> <p><b>Summary</b></p> <p>Lamar Biology did not meet expectations scoring at or above the 50<sup>th</sup> percentile for the <i>Molecular Biology and Genetics</i> subscore (45.5%) and the <i>Molecular Biology and Molecular Genetics</i> assessment indicator (45.5%).</p> <p><a href="#">assessment data 24-25_outcome 3.xlsx</a></p> <p><b>Analysis</b></p> <p>This area has historically been strong, partly due to many of the students being co-enrolled in genetics at the time of the exam. While we did not meet expectations, this area was still one of the stronger sections of this year's test. The department lost its genetics instructor early in the spring 24 semester which resulted in emergency teaching efforts to complete the course. Genetics in the fall 24 semester was taught by the cell biology instructor with little time to prepare the course before the semester start due to a failed summer search. This may have contributed to poor performance particularly in the fall cohort. As with the overall score and the cellular sections, the spring cohort scored higher than the national average on these sections (10 out of 13 students)..</p>	<p><b>Maintain Assessment Strategy</b></p> <p>This is typically a very strong area for our students. The department hired a new genetics instructor who will start in fall 2025. As the course is their primary focus, the students should benefit from the increased attention. One of the additional hires made for the fall also has experience in teaching genetics so will be able to contribute to the building of a strong course as well as providing a "back-up" instructor if the need arises.</p>

Knowledge of Organismal Biology

MEASURES	RESULTS	ACTIONS
<p><b>National ranking comparison</b></p> <p>Direct - Other</p> <p><b>Target</b></p> <p>At least 50% of Lamar biology students will score at or above the national average for the Organismal Biology subscore and the Organismal – Animals and Organismal – Plants assessment indicators.</p>	<p><b>NOT MET</b></p> <p><b>Summary</b></p> <p>Lamar Biology did not meet expectations for 50% of students scoring at or above the national average for <i>Organismal Biology</i> subscore (45.5%), <i>Organismal – Animals</i> (39.4%) and <i>Organismal – Plants</i> (48.5%) assessment indicators. Lamar did achieve its goal of 51% of students scoring at or above the national mean for the <i>Diversity of Organisms</i> assessment indicator. However, the overall mean of Lamar students was equal to the national mean for <i>Organismal Biology</i> subscore and the <i>Diversity of Organisms</i> assessment indicator and higher than the national average for the <i>Organismal – Plants</i> assessment indicator..</p> <p><a href="#">assessment data 24-25_outcome 4.xlsx</a></p> <p><b>Analysis</b></p> <p>While not quite meeting our goal for this cycle this was still a strong area of the test for Lamar students. Using data for the year, two of the three subscores showed improvement over last cycle's cohort, including a 5% increase in the <i>Organismal – Animal</i> subscore. This would indicate that some of the improvements from the previous year are beginning to have the desired effect. We continue to score well above the national average in the <i>Organismal – Plant</i> section as it is a required course that all majors take and is most often taken within a semester of taking the MFE.</p>	<p><b>Revise Benchmark / Target</b></p> <p>Not Started</p> <p>We will decrease the percent of students meeting or exceeding the national average on the subscore and the assessment indicators from 50 % to 48%.</p> <p>Recommended Due Date: 05/29/2026</p>
<p><b>Numbers in the 50th percentile</b></p> <p>Direct - Other</p> <p><b>Target</b></p> <p>At least 50% of Lamar biology students will score at or above the 50th percentile nationally for the Organismal Biology subscore and the Organismal – Animals and Organismal – Plants assessment indicators.</p>	<p><b>NOT MET</b></p> <p><b>Summary</b></p> <p>Lamar Biology partially met expectations for ≥50% of students scoring at or above the 50th percentile for the <i>Organismal Biology</i> subscore (48.5%), <i>Diversity of Organisms</i> (51.5%) <i>Organismal – Animals</i> (24.4%), and <i>Organismal – Plants</i> (63.6%) assessment indicators.</p> <p><a href="#">assessment data 24-25_outcome 4.xlsx</a></p> <p><b>Analysis</b></p> <p>While not quite meeting our goal for this cycle this was still a strong area of the test for Lamar students. Using data for the year, two of the three assessment indicator scores showed improvement</p>	<p><b>Maintain Assessment Strategy</b></p> <p>This is normally a very strong area for our students and we met several of our subgoals for this assessment.</p>

	<p>over last cycle's cohort, including a 5% increase in the <i>Organismal – Animal</i> subscore. This would indicate that some of the improvements from the previous year are beginning to have the desired effect. We continue to score well above the national average in the <i>Organismal – Plant</i> section as it is a required course that all majors take and is most often taken within a semester of taking the MFE.</p>	
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#### Knowledge of Population Biology, Evolution and Ecology

MEASURES	RESULTS	ACTIONS
<p><b>National average comparison</b></p> <p>Direct - Other</p> <p><b>Target</b></p> <p>At least 50% of Lamar biology students will score at or above the national average for the Population Biology, Evolution, and Ecology subscore and the Population Genetics and Evolution and Ecology assessment indicators.</p>	<p><b>NOT MET</b></p> <p><b>Summary</b></p> <p>Lamar Biology did not meet expectations for 50% of students scoring at or above the national average for <i>Population Biology, Evolution, and Ecology</i> subscore (42.4%), <i>Population Genetics and Evolution</i> (27.3%) and <i>Ecology</i> (45.5%) assessment indicators.</p> <p><a href="#">assessment data24-25_outcome 5.xlsx</a></p> <p><b>Analysis</b></p> <p>Our current action plan to address this issue was implemented during the 22-23 reporting cycle and included major revisions to the instructional units of 1406 and 1407 that covered these topics. As this is an entry level course and the students taking the MFE are seniors, there has been insufficient time for the results of these improvements to be realized. As with other sections of the test, the spring cohort scores show a marked improvement over the fall scores, providing evidence that our plan is a work in progress. We will continue to implement our current plan for the next cycle.</p>	<p><b>Revise Benchmark / Target</b></p> <p>Not Started</p> <p>We will decrease the percent of students meeting or exceeding the national average on the subscore and the assessment indicators from 50 % to 48%.</p> <p>In recent discussions, the department identified evolution and ecology as important "core" knowledges all biology majors should have. One of the faculty has voiced an interest in building the sophomore level evolution course and discussions are ongoing as to place it in our curriculum. As this is a major change to the degree plan, full implementation may take some time. Making ecology one of the areas of emphasis or track is an ongoing discussion.</p> <p>Recommended Due Date: 05/29/2026</p>
<p><b>Number in 50th percentile</b></p> <p>Direct - Other</p> <p><b>Target</b></p> <p>At least 50% of Lamar biology students will score at or above the 50th percentile nationally for the Population Biology, Evolution, and Ecology subscore and the Population Genetics and Evolution and Ecology assessment indicators</p>	<p><b>NOT MET</b></p> <p><b>Summary</b></p> <p>Lamar Biology did not meet expectations for 50% of students scoring at or above the 50<sup>th</sup> percentile for <i>Population Biology, Evolution, and Ecology</i> subscore (45.5%); <i>Population Genetics and Evolution</i> (21.2%) and <i>Ecology</i> (33.3%) assessment indicators.</p> <p><a href="#">assessment data24-25_outcome 5.xlsx</a></p> <p><b>Analysis</b></p>	<p><b>Revise Benchmark / Target</b></p> <p><b>IN PROGRESS</b></p> <p>We will decrease the the percentile that we want the students scoring at/or above from 50% to 46%.</p> <p>In recent discussions, the department identified evolution and ecology as important "core" knowledges all biology majors should have. One of the faculty has voiced an interest in building the sophomore level evolution course and discussions are ongoing as to place it in our curriculum. As this is a major change to the degree plan, full implementation may take some time. Making</p>

	<p>Our current action plan to address this issue was implemented during the 22-23 reporting cycle and included major revisions to the instructional units of 1406 and 1407 that covered these topics. As this is an entry level course and the students taking the MFE are seniors, there has been insufficient time for the results of these improvements to be realized. As with other sections of the test, the spring cohort scores show a marked improvement over the fall scores, providing evidence that our plan is a work in progress. We will continue to implement our current plan for the next cycle.</p>	<p>ecology one of the areas of emphasis or track is an ongoing discussion.  Recommended Due Date: 05/29/2026</p>
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### Critical thinking skills

MEASURES	RESULTS	ACTIONS
<p><b>National average comparison</b></p> <p>Direct - Other</p> <p><b>Target</b></p> <p>At least 50% of Lamar biology students will score at or above the national average for the Analytical Skills assessment indicator.</p>	<p><b>NOT MET</b></p> <p><b>Summary</b></p> <p>Lamar Biology did not meet expectations for 50% of students scoring at or above the national average for the <i>Analytical Skills</i> assessment indicator (39.4%).  <a href="#">assessment data 24-25_outcome 6.xlsx</a></p> <p><b>Analysis</b></p> <p>Lamar students continue to struggle in this area, particularly this year's cohort. We believe that we are still dealing with the outcomes of the reduced learning environment that was present during COVID. The critical time when the analytical thinking skills are developed were spent in the online learning environment with inconsistent mentorship and supervision.</p>	<p><b>Revise Benchmark / Target</b></p> <p>Not Started</p> <p>We will decrease the percent of students meeting or exceeding the national average on the assessment indicators from 50 % to 46%. BIOL 1406 and 1407 will continue to develop student centered learning activities in both lecture and lab to develop and foster analytical thinking skills.  Recommended Due Date: 05/29/2026</p>
<p><b>Number in 50th percentile</b></p> <p>Direct - Other</p> <p><b>Target</b></p> <p>At least 50% of Lamar biology students will score at or above the 50th percentile nationally for the Analytical Skills assessment indicator.</p>	<p><b>NOT MET</b></p> <p><b>Summary</b></p> <p>Lamar Biology did not meet expectations for 50% of students scoring at or above the 50th percentile nationally for the <i>Analytical Skills</i> assessment indicator (15.2%).  <a href="#">assessment data 24-25_outcome 6.xlsx</a></p> <p><b>Analysis</b></p> <p>Lamar students continue to struggle in this area, particularly this year's cohort. We believe that we are still dealing with the outcomes of the reduced learning environment that was present during COVID. The critical time when the</p>	<p><b>Revise Benchmark / Target</b></p> <p><b>IN PROGRESS</b></p> <p>We will decrease the the percentile that we want the students scoring at/or above from 50% to 46%. BIOL 1406 and 1407 will continue to develop student centered learning activities in both lecture and lab to develop and foster analytical thinking skills.  Recommended Due Date: 05/29/2026</p>

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