Biological Science [BIOS]

Cycles included in this report:
Jun 1, 2024 to May 31, 2025

Program Name: Biological Science [BIOS]

Reporting Cycle: Jun 1, 2024 to May 31, 2025

1 Is this program offered via Distance Learning?

100% Traditional or less than 50% Distance/Traditional

2 Is this program offered at an off-site location?

No

2.1 If yes to previous, provide addresses for each location where 50% or more of program credits may be earned.

3 Example of Program Improvement

2020-2021:
Assessment was made from BIOL 339, BIOL 404, BIOL 410, BIOL 481. Results from these assessments are incorporated into the report. Due to the sudden, untimely departure of the BIOL 315 professor last year, COVID-19 pandemic restrictions, and the unfortunate hurricane disaster experienced in Fall 2020, a review and redesign of BIOL 315 is continuing.

2021-2022:

2022-2023:
Assessment was made from BIOL 315, BIOL 339, BIOL 410, BIOL 481. Results from these assessments are incorporated into the report.

2023-2024:
Assessment was made from BIOL 315, BIOL 339, BIOL 410, BIOL 481. Results from these assessments are incorporated into the report.

2024-2025:
Assessment was made from BIOL 315, BIOL 339, BIOL 410, BIOL 481. Results from these assessments are incorporated into the report. The question being analyzed for SO3 for Biol 410 was changed due to 100% of students answering correctly for 2 academic years. After the change, 80% of students answered the new question correctly.

4 Program Highlights from the Reporting Year

2020-2021:
COVID-19 pandemic restrictions and destructive hurricanes caused laboratories and lecture rooms in Frasch Hall/Annex to shutdown.

2021-2022:
The program has begun the process of adding a Biology Foundations course that is required for all incoming freshman. The hope is that this course will help the students in their first semester struggles and provide a departmental mentor that the students will seek guidance from throughout their time at McNeese. Second, we have begun the process of developing a Biology club for those students that are not interested in Medical, Dental, or Pharmacy school. This should provide all students with a departmental club that will allow them to have a place within the department.

2022-2023:

2023-2024:
The program implemented the Biology Foundations course in Fall 2023. It would appear that not all incoming freshmen took the course their first semester. I have spoken to the CoSEM freshman advisor to emphasize the importance of students taking the course their first semester of college. We are collecting data on the effect of this course on GPAs and retention. This course is continuing to be offered in Fall 2024. In Fall 2023, we started the Biology Club. Students had several meetings and toured the Path Lab. Students are presently developing an itinerary for the 2024-2025 academic year. Starting in Spring 2024, the biology program began holding monthly research presentations by faculty and students that was open for all biology majors to attend. We will be continuing these presentations in the next academic year. Finally, faculty interacted with the community via six presentations at Calcasieu Parish libraries as well as a tour of the Seale Museum by the 5th grade class from E.K. Key Elementary.

2024-2025:
The program continues to offer the Biology Foundations course. We spoke to Freshman advising to clarify that students should take this course their first semester of college. After this spring, we will have two years of data to evaluate the effect of this course on GPAs and retention. The Women in STEM club was started in this academic year. We modified our Friday Biology Presentations somewhat from Spring 2024. In Fall 2024, we had one presentation a month with both research presentations and presentations regarding various job opportunities with a biology degree. In Spring 2025, we increased meetings to twice a month. Once a month, we have the typical research presentation or job opportunities presentation while the second meeting is a journal article presentation. This format will continue into the next academic year. Finally, faculty interacted with the community via three presentations at Calcasieu Parish libraries as well as a tour of the department by LaGrange students. In addition, students from Rayne High School did a DNA extraction experiment. We will continue these interactions with the community.

5 Program Mission

The purpose of the B.S. in Biological Science is to provide students with the knowledge and skills required for advanced study in graduate or professional schools or to teach biology at the middle or high school level.

6 Institutional Mission Reference

This degree supports the University’s fundamental mission to offer baccalaureate curricula in service to the residents and employers of the SWLA region and beyond. It prepares students to become effective in academic and professional environments.

7 Assessment and Benchmark BIOL 315 Embedded Questions

Assessment: BIOL 315 Embedded Questions.

Benchmark: 75% of all graduates will provide 'satisfactory answers' on embedded problem-solving questions which require the use of critical thinking skills in Genetics (BIOL 315).

Prior to 2017-2018, the benchmark was 75% of graduates will provide 'at least sufficient answers'.

7.1 Data

Academic Year	Graduates who provided 'satisfactory answers'	
	#	%
2020-2021*	—	—
2021-2022	37/48	77%
2022-2023	38/53	72%
2023-2024	33/46	72%
2024-2025	25/26	96%

*Please see analysis

7.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
Due to the very sudden and untimely departure of the Genetics (BIOL 315) professor last spring as well as the cessation of face-to-face instruction due to 2020 COVID-19 pandemic and fall 2020 hurricane destruction, the review and redesign of BIOL 315 is continuing.

2021-2022:
The benchmark was met. This was the first year back to doing this assessment since the 2018-2019 academic year. The percentage of students successfully answering the question increased by 10% over the last assessment. Since this is the first time this assessment question has been used, we will need to acquire more data before making any recommendations on changes to be made.

2022-2023:
The benchmark was not met. This was the first time that Dr. Hennigan did this assessment with the BIOL 315 course. The percentage of students successfully answering the question decreased by 5% compared to the last assessment. A different question and a different professor was used in this assessment so it seems reasonable that there would be differences in the number of students successfully answering the question. Dr. Hennigan will be performing this assessment for the next two semesters, thereby giving us more reliable data.

2023-2024:
The benchmark was not met. This was the second time Dr. Hennigan did this assessment with the BIOL 315 course. The percentage of students successfully answering the question remained constant with the previous academic year at 72%. The two genetics teachers and myself will meet to discuss these results and determine our next step.

2024-2025:
The benchmark was met. The percentage of students successfully answer the questions rose by a large percentage. Hopefully, this will continue, but we will wait and see. No changes to the benchmark will be made at this time.

8 Assessment and Benchmark BIOL 339 Embedded Problem Solving Questions

Assessment: BIOL 339 Embedded Problem Solving Questions.

Benchmark: 80% of all graduates will provide 'satisfactory answers' on embedded problem-solving questions which require the use of critical thinking skills in Evolution (BIOL 339).

Prior to 2017-2018, the benchmark was 80% of graduates will provide 'at least sufficient answers'. Prior to 2016-2017, the benchmark was 75% of all gradutes should provide 'at least sufficient answers'.

8.1 Data

Academic Year	Graduates who provided 'satisfactory answers'	
	#	%
2020-2021*	16/17	94%
2021-2022	45/56	75%
2022-2023	13/14	93%
2023-2024	13/15	87%
2024-2025	16/24	67%

*COVID-19 Pandemic and Hurricane Disaster.

8.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
This benchmark was met. However, data for some graduates were destroyed during the hurricanes/subsequent clean-out and material movement due to contractor mitigation efforts in Fall 2020. BIOL 339 was still taught under COVID-19 Pandemic restrictions. This assessment will continue to be used.

2021-2022:
This benchmark was not met. The previous academic year had a 94% success rate, but this was with limited data due to the hurricanes. Although the benchmark was not met this academic year, it is going in an upward trajectory compared to the academic years prior to the Covid-19 pandemic and hurricanes. We will continue to use this assessment and watch to see if this increase in student success continues.

2022-2023:
The benchmark was met. The previous academic year had a 75% success rate. Therefore there was a 19% increase in the successful completion of the question being assessed. The data seems to suggest that when there are smaller class sizes students seem to be more successful as evidenced by the last four years of analysis. We will continue to monitor this trend to see if this is truly a marker of student success in this method of assessment.

2023-2024:
The benchmark was met. The previous year had a success rate of 93%. Therefore, there was a 6% decrease in successful completion of the question over the last year. This year's percentage is still significantly higher than the 2021-2022 academic year (75%). Since the percentage decreased from the 2022-2023 academic year, we will continue to monitor this method of assessment.

2024-2025:
The benchmark was not met. There was a 20% decrease in successful completion of the question over last year. We will watch to see if this trend turns around next year.

9 Assessment and Benchmark BIOL 339 and 410 Embedded Questions

Assessment: BIOL 339 and 410 Embedded Questions.

Benchmark: At least 85% of the graduates make 'correct' conclusions based on empirical data on embedded exam questions presenting data and requiring analysis and conclusion in BIOL 339 and BIOL 410.

Prior to 2017-2018, the benchmark was at least 85% of graduates make 'sound' conclusions.

9.1 Data

Academic Year	Graduates who made 'correct' conclusions			
	BIOL 339		BIOL 410	
	#	%	#	%
2020-2021	32/37	86%	20/28	71%
2021-2022	25/27	93%	22/23	96%
2022-2023	13/14	93%	24/24	100%
2023-2024	13/15	87%	21/21	100%
2024-2025	22/23	96%	15/17	80%

9.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was met for BIOL 339, but not for BIOL 410. Data for some graduates were destroyed during the hurricanes/subsequent clean-out and material movement due to contractor mitigation efforts in Fall 2020. Both courses were under COVID-19 Pandemic restrictions this year affecting scientific understanding and in-person interaction inherent in STEM education. This assessment will continue to be used.

2021-2022:
The benchmark was met for both BIOL 339 and BIOL 410. BIOL 339 students have met the requirement for the last two academic years, but BIOL 410 students have not met the benchmark in the three years prior. Data will be monitored in future years to determine if questions in BIOL 339 should be changed. No changes will be made to either BIOL 339 or BIOL 410 at present.

2022-2023:
The benchmark was met for both BIOL 339 and BIOL 410. BIOL 339 students have met the requirement for the last three academic years while the BIOL 410 students have met the benchmark for the last two academic years. I will suggest to the BIOL 339 professor to change the questions for BIOL 339 in order to see if the same percentages of students are successfully completing a different student. We will continue with the question for BIOL 410 and monitor the assessment of that question for one more year.

2023-2024:
The benchmark was met for both BIOL 339 and BIOL 410. BIOL 339 students have met the requirement for the last four academic years while BIOL 410 students have met the benchmark for the last three academic years. There was a decrease in the percentage of students that successfully completed the BIOL 339 assessment as compared to the 2022-2023 academic year. This will be monitored for another year to see if this is a trend. BIOL 410 assessments have been at a 100% for the last two academic years. I will suggest to the BIOL 410 professor to change the question analyzed.

2024-2025:
The benchmark was met for Biol 339 but was not met for Biol 410. The Biol 339 percentage of correct answers was 96%, which is a 9% increase over the previous year. The Biol 410 percentage dropped by 20% compared to the previous year. Last year, I suggested that the Biology professor change the question being evaluated. These results may reflect that change.

10 Assessment and Benchmark BIOL 410 Embedded Questions

Assessment: BIOL 410 Embedded Questions.

Benchmark: 75% of all graduates will provide 'satisfactory answers' on embedded problem-solving questions which require the use of critical thinking skills in Ecology (BIOL 410).

Prior to 2017-2018, the benchmark was that 75% of graduates will provide 'at least sufficient answers'.

10.1 Data

Academic Year	Graduates who provided 'satisfactory answers'	
	#	%
2020-2021*	13/20	65%
2021-2022	37/47	79%
2022-2023	24/24	100%
2023-2024	21/21	100%
2024-2025	14/18	78%

*COVID-19 Pandemic and hurricane disaster.

10.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was not met. However, there was an increase compared to last year. Data most likely affected by COVID-19 Pandemic and hurricanes of Fall 2020. Data for some graduates were destroyed during the hurricanes/subsequent clean-out and material movement due to contractor mitigation efforts in Fall 2020. BIOL 410 was still taught under COVID-19 Pandemic restrictions.

2021-2022:
The benchmark was met. There was a considerable increase compared to the previous three years. We will continue to use this assessment for next year and determine whether benchmarks or the method of testing should be changed.

2022-2023:
The benchmark was met. There was an 11% increase over the previous year with all students successfully completing the assessment question. This is an unusual circumstance for all students to be successful. It won't happen every year. At present, it would be good to continue watching the data before suggesting and increase in the benchmark.

2023-2024:
The benchmark was met. The percentage remained stable over the last two academic years. I will suggest that the BIOL 410 professor change the question for the next academic year.

2024-2025:
The benchmark was met. The percentage of students answering this question correctly dropped by 22% over last year. We will continue to monitor this trend to determine if changes should be made.

11 Assessment and Benchmark BIOL 404 Sound Conclusions

Assessment: BIOL 404 Sound Conclusions.

Benchmark: At least 85% of the graduating biological science seniors who enroll in BIOL 404 submit a research paper and/or present a poster or oral presentation at a professional meeting in which 'correct' conclusions were made after analyzing empirical data.

Prior to 2017-2018, the benchmark was at least 85% of the graduating biological science seniors who enroll in BIOL 404 submit a research paper and/or present a poster or oral presentation at a professional meeting in which 'sound' conclusions were made after analyzing empirical data.

11.1 Data

Academic Year	Seniors who provided 'sound conclusions'	
	#	%
2018-2019	4/4	100%
2019-2020	8/9	89%
2020-2021	9/9	100%
2021-2022	11/11	100%
2022-2023	8/10	80%
2023-2024	4/4	100%
2024-2025	7/7	100%

11.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
This benchmark was met. This assessment will continue to be used and more students will be encouraged to enroll in research courses. The current COVID-19 Pandemic and recent destructive hurricanes affected in-person interaction inherent in research courses.

2021-2022:
This benchmark was met. With face-to-face classes resuming, students had a better opportunity for interacting with professors one-on-one for research purposes. This assessment will continue to be used.

2022-2023:
This benchmark was not met. The two students that did not meet expectations received an "I" in the course. Therefore, all students that finished the course with a grade met expectations. This assessment will continue to be used.

2023-2024:
The benchmark was met. Interestingly, there were more juniors taking the course (5) as compared to seniors (4). This assessment will continue to be used for the next academic year. If we continue to have a significant number of juniors taking the course, we will change the assessment to include all students and not just seniors.

2024-2025:
The benchmark was met. This semester, there were 7 graduating seniors taking the course and 3 juniors. This assessment will continue to be used for the next academic year. If we continue to have a significant number of juniors taking the course, we will change the assessment to include all students and not just graduating seniors.

12 Assessment and Benchmark BIOL 481 Senior Seminar

Assessment: BIOL 481 Senior Seminar.

Benchmark 1: At least 85% of the students will achieve a grade of 70% or higher on the writing rubric.

Benchmark 2: At least 85% of the students will earn a grade of 70% or higher on the Biology Seminar rubric used by all biology faculty members who attend the students' seminar presentations.

12.1 Data

Academic Year	Students achieving 70%	
	#	%
2020-2021	43/52	83%
2021-2022	39/44	89%
2022-2023	38/42	90%
2023-2024	26/44	59%
2024-2025	31/42	74%

12.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was not met. This is the third year below benchmark. Writing reviews continued to be used and there was an increase in the percent of achievement; however, the increase did not meet benchmark. Other factors most likely affecting the percent was the online instructional environment due to COVID-19 Pandemic as well as destructive hurricanes of Fall 2020. This assessment will continue to be used and proficiency in writing will be addressed.

2021-2022:
The benchmark was met. This is the first year above benchmark since the academic year 2017-2018. Writing reviews continued to be used. There was an increase in the percent of achievement. Other factors most likely affecting the percent was the continued online instructional environment due to COVID-19 Pandemic as well as continued recovery efforts from the destructive hurricanes of Fall 2020. Since this is the first time attaining benchmark in the last four years, this assessment will continue to be used.

2022-2023:
The benchmark was met. This is the second year above benchmark since 2017-2018. Writing reviews continued to be used. Percent of achievement continues to increase. Since this is the second time attaining benchmark in the last five years, this assessment will continue to be used.

2023-2024:
The benchmark was not met. This is the first year of the last three years below benchmark. Writing reviews continued to be used. For 2023-2024, a new format for seminar textual matter was introduced to continue strengthening STEM skills. This assessment will continue to be used and proficiency in writing will be addressed as well as integrated next-generation STEM concepts.

*Note: Most students in this year/class-group were the first cluster transitioning to college life during the initial stages of the COVID-19 pandemic and the two hurricanes that struck Lake Charles in Fall 2020.

2024-2025:
The benchmark was not met. However, there was a substantial increase from AY 2023-2024. This is the second year of the last three years below benchmark. Writing reviews continued to be used. The use of new formats for seminar textual matter and review were continued to strengthen STEM skills. Break-out sessions were established to assist students in next-generation STEM concepts. This assessment will continue to be used and proficiency in writing will continue to be addressed.

*Note: Most students in this year/class-group were in their senior year in high school during the initial stages of the COVID-19 pandemic and the two hurricanes that struck Lake Charles in Fall 2020 and were in the beginning stages of the transition to college.

12.2 Data

Academic Year	Students achieving 70%	
	#	%
2020-2021	52/52	100%
2021-2022	43/44	97%
2022-2023	41/42	97%
2023-2024	41/44	93%
2024-2025	39/42	93%

Files:

BIOL 481 Presentation Rubric - Jul 2017

BIOL 481 Presentation Rubric - Jul 2017

12.2.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was met. The assessment will continue to be used since online instruction due to COVID-19 Pandemic may/will affect presentation assessment. Online instructional environments are counter intuitive to scientific understanding and in-person interaction inherent in capstone education. However, due to the pandemic and recent hurricane destruction, adaptations are still under consideration.

2021-2022:
The benchmark was met, but a decrease was noted. The assessment will continue to be used since there was a return this academic year to in-class presentations from online instruction and presentations due to COVID-19 Pandemic. This transition may affect presentation assessment.

2022-2023:
The benchmark was met, but, again, a decrease was noted from 2020-2021, and a slight decrease (0.10) from 2021-2022. The assessment will continue to be used with the return this academic year to in-class presentations since the return to an in-class format may affect presentation assessment.

2023-2024:
The benchmark was met, but a decrease was noted from the previous year (2022-2023). The percentage also was the lowest since 2015-2016. For 2023-2024, a new format was introduced to continue strengthening STEM skills. This assessment will continue to be used since the data show a decrease. Further review may be required.

2024-2025:
The benchmark was met. The percentage was consistent with last year showing a stabilization in the downward trend seen last year. This assessment will continue to be used.