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## Mathematical Sciences [BS] [BS-MSCI]

**Cycles included in this report:**

Jun 1, 2024 to May 31, 2025

**Program Name: Mathematical Sciences [BS] [BS-MSCI]****Reporting Cycle: Jun 1, 2024 to May 31, 2025****1 Is this program offered via Distance Learning?****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:

All program faculty learned to teach online. Students gained experience presenting their work online and collaborating with others online.

2021-2022:

The schedule has been changed to better suit student needs.

2022-2023:

Starting in the fall of 2023 the two courses Math 170 and Math 175 will be replaced by one course with the new name Math 177.

One of the reasons for this change is to better prepare Math majors and other students for Math 190, first semester calculus. The sequence of topics in Math 177 is designed to better achieve this objective of better preparation for Math 190.

2023-2024:

Stats 231 replaces the free math elective in the degree program. This will ensure that our majors have more options later in their program in the upper division classes.

2024-2025:

New Intro to Data Science course (Stat 333) has been developed and will be piloted in Fall 2025.

#### 4 Program Highlights from the Reporting Year

2020-2021:

Austin Nelson scored 200 on the Major Field Test. This is the highest score possible. He is pursuing a Ph.D. at Texas Tech U. this coming fall.

2021-2022:

One of the undergraduate teams placed 4th in the MAA Undergraduate Team Competition at the MAA Section meeting in Natchitoches in March. Kaitlyn Owen was accepted into the Masters program at ULL. Shrijan Dakal and Alex Baur were accepted in the Master's program here at McNeese.

2022-2023:

One of our majors, Ngoc Bui, won 2nd place in the annual Integration Bee, held on March 2, 2023 on the campus of the University of Mississippi. This competition is held in conjunction with the annual section meeting of the Louisiana-Mississippi Section of the Mathematical Association of America. There were some 50 undergraduate competitors from many of the universities in Louisiana and Mississippi.

2023-2024:

Dylan Coats, one our former majors, was featured in the *Lake Charles American Press* in January of 2024. The title of the story was "Dylan Coats experiences consistent joy in the classroom." Dylan is a high school teacher at Iowa High School.

2024-2025:

Grant was awarded for further development of materials for Rowdy's Math Rodeo, a collection of interactive games that is used in outreach to high school students. Students at the regional Science Fair and at our Unlock Education event in Spring 2025 enjoyed taking part in the rodeo activities and we look forward to expanding outreach through use of grant funds.

#### 5 Program Mission

The purpose of the Bachelor of Science in Mathematical Sciences program is to provide students with a solid grounding in mathematics, encourage students to become effective problem solvers and foster the students' ability to effectively convey their mathematical knowledge. Concentrations in Mathematics, Statistics, Mathematics Education, Physics Education and Physics are offered within this degree program. The Mathematics/Physics Education concentrations provide graduates with practical skills in the professional competencies required of mathematics/physics teachers and lead to certification to teach mathematics/physics at the secondary level, grades 6-12, in the State of Louisiana. Other concentrations prepare students for a variety of careers in mathematical sciences or for entrance into a graduate program in mathematical sciences. Stakeholders: graduate schools, employers.

#### 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 MATH 190 Final Exam

Assessment: MATH 190 (Calculus I) final exam embedded questions.

Benchmark: 60% of students will achieve 60% success on items assessing problem-solving skills on the Math 190 final exam.

## 7.1 Data

MATH 190:

Term	Students with 60% or higher		Benchmark met?
	#	%	
Fall 2019	1/2	50%	No
Spring 2020	1/1	100%	Yes
Fall 2020	—	—	—
Spring 2021	1/1	100%	Yes
Fall 2021	2/3	67%	Yes
Spring 2022	3/5	60%	Yes
Fall 2022	2/2	100%	Yes
Spring 2023	1/2	50%	No
Fall 2023	—	—	—
Spring 2024	0/1	0%	No
Fall 2024	3/3	100%	Yes
Spring 2025	3/4	75%	Yes

### 7.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:

Data from fall is missing and there were very few math majors enrolled in Math 190 in the spring.

2021-2022:

Going back to in-person classes has helped us achieve our benchmark.

2022-2023:

By replacing the prerequisite of Math 170/Math 175 with Math 177 we hope to achieve better results.

2023-2024:

There is only one data point this time.

2024-2025:

Benchmark met.

## 8 Assessment and Benchmark MATH 411 Course-embedded Assessment

Assessment: MATH 411 Course-embedded assessments of ability to construct valid mathematical arguments.

Benchmark: 70% of majors will achieve 70% or greater success on the relevant final exam questions in MATH 411, Advanced Calculus.

## 8.1 Data

Academic Year	Majors achieving a 70% success rate		Benchmark met?
	#	%	
2020-2021	4/5	80%	Yes
2021-2022	4/6	67%	No
2022-2023	4/6	67%	No
2023-2024	6/9	67%	No
2024-2025	2/6	33%	No

### 8.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:

Continue to assign problems involving multi-step proofs, giving students the opportunity to reflect and provide hints and guidance when needed.

2021-2022:

All of the students demonstrated knowledge and ability to apply the Mean Value Theorem.

2022-2023:

The students who did not meet the benchmark missed a lot of class and had some nonacademic issues. Faculty will discuss individual cases and work to help these students to be more successful.

2023-2024:

Students were proficient in applications of the Binomial Theorem. Students were less proficient in the application of the Intermediate Value Theorem. More emphasis will be given to the latter theorem.

2024-2025:

While only 2 students scored 70% or higher on relevant items, 3 students scored between 65% and 70%. Thus 5 out of 6 (83%) came near to achieving proficiency on this assessment. We will continue to monitor these results.

## 9 Assessment and Benchmark MATH 421 Course-embedded Assessment

Assessment: MATH 421 Course-embedded assessments of ability to construct valid mathematical arguments.

Benchmark: 70% of majors will achieve 70% success on the relevant final exam questions in MATH 421, Modern Algebra.

### 9.1 Data

Academic Year	Majors achieving a 70% success rate		Benchmark met?
	#	%	
2020-2021	4/5	80%	Yes
2021-2022	4/6	67%	No
2022-2023	5/7	71%	Yes
2023-2024	7/12	58.3%	No
2024-2025	5/6	83%	Yes

### 9.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:

Students did well considering the impacts of the natural disasters occurring during the fall semester.

2021-2022:

Most students demonstrated ability to verify that two groups are isomorphic. Some students struggled to construct proofs, since the previous two years were difficult academically.

2022-2023:

We will continue to emphasize student proof presentations to their peers. We are very pleased with the results so far. These presentations provide a opportunity for a discussion of what constitutes a proof in modern algebra and more generally in mathematics.

2023-2024:

Abstract algebra is challenging for most of our students. A number of the students this year who did not meet the benchmark have required additional support from faculty earlier in their program. Because of this support, we have been able to retain several of these students in the program. In fact, two of the students are graduating this semester.

2024-2025:

Benchmark met.

## 10 Assessment and Benchmark MATH 431 Course-embedded Assessments

Assessment: MATH 431 Course-embedded assessments of ability to construct valid mathematical arguments.

Benchmark: 70% of majors will achieve a 70% success rate on relevant final exam questions in MATH 431, Mathematical Statistics and Probability.

### 10.1 Data

Academic Year	Majors achieving a 70% success rate		Benchmark met?
	#	%	
2020-2021	4/5	80%	Yes
2021-2022	4/4	100%	Yes
2022-2023	4/4	100%	Yes
2023-2024	2/3	67%	No
2024-2025	—	—	—

### 10.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:

Program faculty are pleased that the benchmark was met.

2021-2022:

Program faculty are pleased that the benchmark was met.

2022-2023:

Study of fundamental distributions has been successful. Emphasis on this study will continue.

2023-2024:

Since there were only three students involved, and just one did not meet the benchmark, faculty will wait and see if the trend continues.

2024-2025:

There were no Mathematical Science majors completing this assessment this year

## 11 Assessment and Benchmark MATH 491 Capstone Project

Assessment: MATH 491 Capstone Project

Benchmark 1: Average scores will be 90% on the following items from the presentation evaluation form filled out by faculty members: Content, Organization, and Delivery.

Prior to 2018-2019, the benchmark was average scores will be 80%.

Benchmark 2: 100% of students will achieve a satisfactory rating on the research paper for the capstone project.

### 11.1 Data

Academic Year	# of students	Content	Organization	Delivery	Benchmark met?
2020-2021	4	95.60%	97.6%	97.00%	Yes
2021-2022	4	94.86%	94.31%	96.42%	Yes
2022-2023	—	—	—	—	—
2023-2024	7	78.82%	86.93%	90.86%	No
2024-2025	5	90.76%	91.26%	91.72%	Yes

#### 11.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:

Students again presented online. Students and faculty learned to troubleshoot technology problems. We benefited from our experience from last year.

2021-2022:

Presentations were back to in-person presentations. This provided students with a better experience presenting to a live audience.

2022-2023:

Our Math Education majors are not required to do a capstone project. They are required to do student teaching. Results and plans concerning their experience in student teaching appear in the latter part of this document.

2023-2024:

Some student presenters failed to provide references, while others had difficulty answering audience questions. This in part accounts for the lower scores. Faculty plan to warn students next time that these items are important and must be provided.

2024-2025:

Some student presenters seemed to have a greater comfort level with the material they presented than others. This is perhaps a result of the variation in level of rigor among the topics presented. Faculty are considering revising the instrument used to assess these presentations.

### 11.2 Data

Academic Year	Students that achieved a satisfactory rating		Benchmark met?
	#	%	
2020-2021	4/4	100%	Yes
2021-2022	4/4	100%	Yes
2022-2023	—	—	—
2023-2024	7/7	100%	Yes
2024-2025	5/5	100%	Yes

### 11.2.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:

Faculty were very pleased with the depth of understanding demonstrated in the student papers.

2021-2022:

The rubric has been working out well. It is easy to apply.

2022-2023:

No results for this year.

2023-2024:

Faculty are pleased with this years results.

2024-2025:

Benchmark met.

## 12 Assessment and Benchmark Alumni Survey

Assessment: Particular items on the Alumni Survey serve as indirect assessments of student learning.

Benchmark 1: The average scores for the following items will be 4.50:

7a - Critical thinking skills

7b - Mathematical problem solving

Prior to 2018-2019, the benchmark was 4.00.

Benchmark 2: The average scores for the following items will be 4.00:

7e - Effective oral communications

7f - Effective written communications

### 12.1 Data

Academic Year	# of respondents	Average 7a	Average 7b	Benchmark met?
2020-2021	0	—	—	—
2021-2022	2	5.00	5.00	Yes
2022-2023	4	5.00	5.00	Yes
2023-2024	3	5.00	5.00	Yes
2024-2025	2	4.75	4.50	Yes

### 12.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:

No survey data due to hurricanes and pandemic.

2021-2022:

Data collection has resumed. We are looking at ways to improve data collection.

2022-2023:

We are very happy with our results.

2023-2024:

We continue to be happy with our results. There is no obvious trend over the last few years.

2024-2025:

Faculty noticed a slight drop in the responses. We are still satisfied with the results (both questions are still over 90%). But we are monitoring the results to see if there is a new trend.

## 12.2 Data

Academic Year	# of respondents	Average 7e	Average 7f	Benchmark met?
2020-2021	0	—	—	—
2021-2022	2	5.00	4.50	Yes
2022-2023	4	4.75	5.00	Yes
2023-2024	3	4.33	4.00	Yes
2024-2025	2	4.550	4.50	Yes

### 12.2.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:

No survey data due to hurricanes and pandemic.

2021-2022:

Data collection has resumed. We are looking at ways to improve data collection.

2022-2023:

We are very happy with the results. Informal discussions with recent graduates confirms these survey results.

2023-2024:

We continue to be happy with our results. There is no obvious trend over the last few years.

2024-2025:

The data have improved. The faculty are pleased with this result.

## 13 Assessment and Benchmark Exit Survey

Assessment: Particular items on the Exit Survey serve as indirect assessments of student learning.

Benchmark: The average scores for the following items will be 4.00:

31 - Confidence in ability to solve a problem in your discipline

32 - Confidence in ability to design a problem solution in your discipline

Prior to 2018-2019, the benchmark was 3.50.

### 13.1 Data

Academic Year	Average 31	Average 32	Benchmark met?
2020-2021	5	5	Yes
2021-2022	4.50	4.50	Yes
2022-2023	4.50	5.0	Yes
2023-2024	4.67	4.0	Yes
2024-2025	5.0	5.0	Yes

#### 13.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:

Based on comments from our survey we are considering ways to help our education majors with the content they need to teach their classes.

2021-2022:

We had 4 of the 5 exit surveys returned to us. We are happy to have a representative amount of data.

2022-2023:

Only two surveys, both from math education majors. We are very pleased with the results.

2023-2024:

We are happy with this year's results. Data shows that we continue to meet the benchmark.

2024-2025:

The faculty are pleased with the result. We hope to improve the response rate of the survey in the coming year.

### 14 Assessment and Benchmark Students

Assessment: Students' professional participation.

Benchmark: At least one student will deliver a presentation at a professional event every two years.

#### 14.1 Data

Academic Year	# of presentations	Benchmark met?
2020-2021	—	—
2021-2022	—	—
2022-2023	Mia Escareno directed a math ed session for the conference "Unlock Education" on February 2, 2023	Yes
2023-2024	—	—
2024-2025	—	—

### 14.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:

No undergraduate presentations this year.

2021-2022:

No undergraduate presentations this year.

2022-2023:

We are very pleased Mia was able to contribute to this math education conference. We will encourage other such participation of other math ed students in addition to encouraging non math ed students to present at local conferences, in particular the Louisiana Academy of Sciences conference and the section meeting of the Mathematical Association of America.

2023-2024:

No undergraduate presentations this year.

2024-2025:

No undergraduate presentations this year. Faculty have identified a number of students to potentially speak at the upcoming sectional meeting.