

Annual Academic Assessment Report
Department of Mathematical Sciences
MATHBA and MATHBS
2024-2025

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Across the many programs within the Department of Mathematical Sciences (BA/BS, MS, PhD) there are common learning objectives recognized by the faculty. While the program requirements show differences in the skills and tools employed within the various options, the learning objectives are stated broadly to apply to each.

- Critical and analytical thinking
- Effective communication of abstract and technical information
- Logical reasoning
- Mastery of computational tools for analyzing data and/or mathematical structure
- Problem solving
- Understanding of algorithms and processes

The overall number of graduating math majors has declined in recent years (average 27 over last 7 years), mainly caused by a decrease in the number of students seeking a MATHBA. This change is most likely related to trends in the profession of secondary education as traditionally most of the students in the MATHBA program are interested in careers in math education. The data below is from the Office of Strategic Analytics & Insights.

	2018	2019	2020	2021	2022	2023	2024
MATHBA	12	14	5	6	10	5	3
MATHBS	15	22	22	19	21	20	18
Total	27	36	27	25	31	25	21

Note: data from 2025 is not available yet.

Analysis of Assessment of Student Learning Outcomes

The Department of Mathematical Sciences employs four main tools for assessing the student learning outcomes of the undergraduate majors in our department.

- A. [Course work](#)
- B. [Senior Writing Requirement](#)
- C. [Exit Interview](#)
- D. [Mathematics Field Test](#)

A. Course Work: Students complete a rigorous program of courses that is routinely monitored and updated by the department's Undergraduate Committee. Courses include assignments that assess the previously mentioned learning outcomes by means of written work (both computational and theoretical) and presentations (both formative and summative). The assignments involve a mixture of individual work and work in groups.

B. Senior Writing Requirement: Each student is required to write a research/analytical paper in the Mathematics Major Seminar (MATH 49303) that fulfills the Fulbright Writing Requirement. The student creates a ten-minute presentation based on this work which is presented to the class. An honors thesis and defense can substitute for this requirement. The student selects a topic reflecting their own interests, which is approved by the course instructor. The student's work on the paper and presentation goes through stages of instructor and peer review to ensure quality and clarity. Both the written paper and the presentation are assessed using an instructor crafted rubric that measures the student's mathematical knowledge, depth of understanding, and ability to communicate this material. This pair of assignments satisfies General Education Learning Outcomes 1.2 and 6.1.

Sample topics from the Seminar in Spring 2025 are given to show the breadth of interest among majors:

- The Wave Equation
- Ultrafilters in the Context of Set Theory
- Matrix Groups and Random Matrices
- An Investigation of Regularization Techniques for Overfitting Prevention in Regression Analysis
- Effects of NFL Success on Crime Rate

C. Exit Interview: Students in the Mathematics Major Seminar (MATH 49303) complete an "Exit Interview Survey" that measures their satisfaction with our program, gives them a way to suggest improvements, and allows us to record their immediate plans upon graduation. The principal audience in MATH 49303 was students that graduated in Spring 2025 or will be graduating in Fall 2025. However, some students that plan to graduate in Spring 2026 also took this course if they will be student teaching in Spring 2026.

In Spring 2025, there were 32 responses to the Exit Interview survey.

The first five items are scored on a 1–5 stars scale with 1 star being poor and 5 stars being excellent. These items assess the students' view and impression of the faculty and the department. The average ratings from the previous three years are tabulated below.

Item	Average Rating		
	Spring 2023	Spring 2024	Spring 2025
Quality of instruction from faculty in the department	4.26	4.45	4.25
Concern of department faculty toward math majors	4.33	4.31	4.47
Sense of community among math majors and math faculty	4.07	3.83	4.09
Quality of advising from mathematics faculty mentor	4.26*	4.13**	3.96***
Overall assessment of the Department of Mathematical Sciences	4.22	4.34	4.38
Number of Student Responses	27	29	32

* - 5 students did not know who their faculty mentor was

** - 13 students did not know who their faculty mentor was

*** - 6 students did not know who their faculty mentor was

These numbers are quite strong and show that the students' overall assessment of our program is high. Places where there continues to be room for improvement are building community and communicating with our majors who their faculty mentor is. The general upward trend in concern of faculty toward majors and overall assessment is a positive sign and one to keep heading in the right direction.

The next set of three questions are scored on a 1–5 Likert scale with 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. These items assess the students' view and impression of the major. The average ratings from the previous three years are tabulated below.

Item	Average Rating		
	Spring 2023	Spring 2024	Spring 2025
The courses required for the major were challenging	2.22	4.1	4.22
The program prepared me well for my career plans	1.74	3.59	4.03
I would recommend becoming a math major at the University of Arkansas to others	1.78	3.97	4.16
Number of Student Responses	27	29	32

Note: the scale was flipped in Spring 2024 so that higher numbers are associated with positive reactions in both sets of questions. The data in Spring 2023 is corrected to this new scale. The low numbers in these years maybe be a result of the conflicting orientation of the scales.

These numbers in Spring 2025 show that most of our majors find our courses challenging and are increasingly aligning with their career goals. The overwhelming majority of our students

would recommend being a major in our department to others with only 2 students answering “Strongly Disagree” or “Disagree” with this statement. Another data point showing the high level of satisfaction among our majors is that only 1 of the 32 students in Spring 2025 answered “No” to the question, “Are you glad you chose to be a math major?”

Only 3 of the 32 students responded that they were not satisfied with the variety of courses offered by the department. Of those three, they asked for:

- Data science
- More applied math
- Upper-level honors

With planned hires we hope to address these concerns, which are like those from previous Exit Interview Surveys. We did offer a first course on Topology in Spring 2025, which was a previous frequent request. This course had 9 undergraduates and 4 graduate students. We hope to routinely offer this course going forward.

Eleven of the 32 students in Spring 2025 responded that they plan to go on to graduate school in math or another subject including Computational Biology, Finance, or Physics. The schools listed for these students are:

- Georgia Tech
- Grand Canyon University
- North Carolina State University
- Purdue University
- Temple University
- University of Arkansas
- Yale University

Ten of the 32 students mentioned teaching in secondary education as a career plan, which is the same as last year and a large increase over prior years. Many of these students are in the MATHBA program and plan to graduate in Spring 2026, so perhaps we will see the number of majors increase. Six of the 32 students had a job lined up in industry (Capital One, Lockheed Martin, Brynic Solutions, Mathnasium, Capspire, VIMO) and the rest either did not have post-graduation plans or did not share them with us. About half of the students (15 of 32) taking the survey were not graduating in Spring 2025 and so it is not surprising that many did not have definitive plans to share. We hope to collect more complete data in an Alumni survey.

D. Mathematics Field Test: [The Mathematics Field Test \(MFT\)](#) is taken by students at more than 150 colleges across the United States as a tool to evaluate our student’s ability to:

- analyze and solve problems
- understand relationships
- interpret material from their major field of study

Our students take this assessment in lieu of a final exam in the Mathematics Major Seminar (MATH 49303).

Average (mean) scores from the previous three years appear in the table below broken down by degree program (MATHBA and MATHBS). The number in parentheses indicates the number of students taking the test in that group. A perfect score is 200.

	Spring 2022	Spring 2023	Spring 2024	Spring 2025
US Average	157.5	157.4	157.4	*
MATHBA	150 (5)	147 (5)	150 (7)	142.2 (11)
MATHBS	166.1 (15)	163.5 (20)	165.6 (22)	169.5 (24)
Combined BA/BS	162.1 (20)	160.7 (25)	162.25 (29)	160.9 (35)
# of Perfect Scores	2	4	2	5

*- US Average from Spring 2025 not available yet

The number of students receiving a perfect score was the highest ever in Spring 2025 and the average among MATHBS students is steadily increasing as well. The combined BA/BS is above the national average (73 percentile).

Broken down in the five assessment areas of the MFT we find that our majors are performing above the national average in all areas.

Assessment Item	UARK % Correct	National % Correct
Calculus	34	31.1
Algebra	39	33.3
Routine	37	33.2
Nonroutine	33	26.2
Applied	36	35.3

Our relative strength in “Algebra” and “Calculus” matches our department faculty. The higher-than-average score in “Nonroutine” is evidence of the problem-solving ability of our students.

We remark that some of the students in the MATHBA program are taking the MFT at the end of their junior year as opposed to their senior year as they will be student teaching in spring of their senior year and not on campus. This could account for the lower scores in the MATHBA program. The increase in the number of students taking this test should result in an increase in the number of majors we see in future assessment reports.

Changes To Degree Planned or Made Based on Assessment

We have no immediate plans to change the degree based on this assessment. The department continues to recognize the need for the creation of a degree plan and more courses for students interested in statistics and applications of mathematics. This is influencing our staffing plans.

Changes To the Assessment Process Planned or Made

We plan to include an alumni survey in our annual assessment. This survey is still in the process of being drafted and will go out to alumni shortly.