

Program Assessment Report 2017-2018

Program Name: Mathematics, B.S

Program Learning Outcome: 1). Demonstrate college-level knowledge in foundational mathematics, e.g., Calculus and Linear Algebra

1. Identify the artifact(s) (i.e. student work or outputs) that you used to assess the PLO. [Projects, papers, presentations, portfolios, exam questions, specific assignments, capstone work]

Artifacts: Exam Questions

Other artifact(s)

Percent Correct Institution	Percent Correct National ^(b)	Percent Omit	Percent Not Reached	Domain	Content Area
66.7	61.4	0	0	Calculus	--
63	47.7	3.7	0	Calculus	--
29.6	27.2	0	0	Calculus	--
14.8	15	0	0	Calculus	--
40.7	28	0	0	Calculus	--
25.9	20.8	0	0	Calculus	--
53.8	46.8	0	3.7	Calculus	--
42.3	32.3	0	3.7	Calculus	--
53.8	32.2	0	3.7	Calculus	--
38.5	39.9	0	3.7	Calculus	--
19.2	14.6	3.7	3.7	Calculus	--
23.1	26	3.7	3.7	Calculus	--
15.4	14	0	3.7	Calculus	--
34.6	35.2	0	3.7	Calculus	--
46.2	35.3	0	3.7	Calculus	--

Percent Correct Institution	Percent Correct National ^(b)	Percent Omit	Percent Not Reached	Domain	Content Area
48.1	37.6	0	0	Algebra	Linear Systems

59.3	48.4	0	0	Algebra	Linear Systems
38.5	33.6	7.4	3.7	Algebra	Linear Systems

Percent Correct Institution	Percent Correct National ^(b)	Percent Omit	Percent Not Reached	Domain	Content Area
48.1	36.3	0	0	Algebra	Vector Spaces
11.1	27.6	0	0	Algebra	Vector Spaces
18.5	21.3	0	0	Algebra	Vector Spaces
25.9	24.3	0	0	Algebra	Vector Spaces
61.5	41.5	0	3.7	Algebra	Vector Spaces
50	40.7	0	3.7	Algebra	Vector Spaces

- Identify the instruments (e.g. rubrics, surveys, spreadsheets, statistical software) used to assess the artifact(s) (i.e. the way in which student output are analyzed).

Instruments: Spreadsheets

Other instruments Used

The item information report provided by Educational Testing Services for the Major Field Test in Mathematics. We considered the timeline 2015-2017 in order to have a sample of sufficient size (27 students) to compare to national results.

- Describe program collaboration to plan, implement and use the results of assessment.

We plan to use the results on this exam to pinpoint specific concepts in foundational mathematics courses, i.e., Calculus and Linear Algebra, we may wish to reinforce in our program. The results will be shared with the entire department and be up for discussion at departmental meeting(s).

Explain the results of the assessment activities.

Our students continue to exceed the national average in the vast majority of areas from Calculus (approximately 73% of the time). Moreover, our students were within 3% of the national average

on the remaining questions. Specifically, 15 vs. 14.8, 39.9 vs. 38.5, 26 vs. 23.1, and 35.2 vs. 34.6. Furthermore, three out of four of these questions, 3.7% of our students did not reach, meaning they did not answer the questions nor any subsequent questions.

Our students exceed the national average 100% of the time on questions identified as Linear Systems and approximately 67% of the time on questions in the area of Vector Spaces. These are both topics from Linear Algebra. However, there is no way of knowing if the questions on Vector Spaces were more theoretical in nature and should be, in fact, mapped to Abstract Algebra, i.e., not foundational. For these problems, it is also worth noting that the national average was less than 28% indicating a high level of difficulty.

4. Where applicable, outline the steps you will take to make improvements to the program based on the results of assessment activities identified in #3.

We will continue to monitor student performance on this exam. Furthermore, the department will discuss whether or not to emphasize vector spaces more throughout the curriculum, particularly in the Linear Algebra course. It is important to note that the scores do not differentiate between students who are pursuing the B.A. versus the B.S. degree. Those in the former may not encounter the topic of vector spaces in any other course.

Program Assessment Report 2017-2018

Program Name: Mathematics, B.S

Program Learning Outcome: 4).Demonstrate college-level knowledge in algebra/geometry

1. Identify the artifact(s) (i.e. student work or outputs) that you used to assess the PLO. [Projects, papers, presentations, portfolios, exam questions, specific assignments, capstone work]

Artifacts: Exam Questions

Other artifact(s)

Percent Correct Institution	Percent Correct National ^(b)	Percent Omit	Percent Not Reached	Domain	Content Area
63	25.7	0	0	Algebra	Abstract
48.1	23.6	0	0	Algebra	Abstract
40.7	33.9	0	0	Algebra	Abstract
65.4	56.8	0	3.7	Algebra	Abstract
73.1	50.3	0	3.7	Algebra	Abstract
11.5	17.2	0	3.7	Algebra	Abstract

29.6	19.8	0	0	Other Topics	Geometry
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2. Identify the instruments (e.g. rubrics, surveys, spreadsheets, statistical software) used to assess the artifact(s) (i.e. the way in which student output are analyzed).

Instruments: Spreadsheets

Other instruments Used

The item information report provided by Educational Testing Services for the Major Field Test in Mathematics. We considered the timeline 2015-2017 in order to have a sample of sufficient size (27 students) to compare to national results.

3. Describe program collaboration to plan, implement and use the results of assessment.

Areas of advanced mathematics that were specifically studied included: Abstract Algebra and Geometry. Our students surpassed the national average over 85% of the time on these questions; specifically, they were lower on one question in Abstract Algebra (11.5 versus a national score of 17.2). The low national average in Abstract indicates an extremely high difficulty level for this question. Furthermore, as mentioned previously, the scores do not differentiate between students pursuing the B.A. versus the B.S degree. Those pursuing the B.A. degree are not required to take Abstract Algebra, and thus, may not have seen those topics.

Explain the results of the assessment activities.

The results indicate our majors are graduating with a strong foundation in Algebra and Geometry.

4. Where applicable, outline the steps you will take to make improvements to the program based on the results of assessment activities identified in #3.

Continue to monitor progress on this objective.

