

**Academic Affairs Assessment of Student Learning**

**Report for Academic Year 2022-2023**

**Department/Program: Mathematics**

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1. **Which learning outcomes did you measure this past year?** The mathematics program measured six of its learning outcomes this year as planned. PLO 7 was not assessed, since its measurement currently depends on the applicability of a student paper and presentation (in Math 408) to the PLO, which didn’t occur in Spring 2023. The initial measurement (in Math 206) was done in both Fall 2022 and Spring 2023. The second measurement (in Math 208) was done in both Fall 2022 and Spring 2023. The final measurement (in Math 408) was done as scheduled in Spring 2023. Outcomes 1-4 and 6 (initial measurement) were measured in Math 206, outcomes 1-4 (second measurement) were measured in Math 208, and outcomes 1-5 (final measurement) were measured in Math 408.
2. **In which course(s) were assessments conducted?**

Outcomes were measured in Math 206 (initial measurement), Math 208 (second measurement) and Math 408 (final measurement).

1. **How did you assess the selected program learning outcomes?** All outcomes were measured using standard departmental exams combined with item analysis.
2. **How many students were included in the assessment(s) of each PLO in a course?**

For the initial measurement of PLOs 1-4 and 6, nine students in Fall 2022 and nine students in Spring 2023 were included. For the second measurement (PLOs 1-4), four students in Fall 2022 and two students in Spring 2023 took the test. For the final measurement (PLOs 1-5) in Spring 2022, two students took the test. None of their papers/presentations could be used to measure PLO 7.

1. **How were students selected to participate in the assessment of each outcome?**

All students who were present the day the test was given were included.

1. **In general, describe how each assessment tool (measure) was constructed** (i.e. in-house, national, adapted).

All instruments were constructed in-house.

1. **Who analyzed results and how were they analyzed**

The data was run through two computer programs to generate a score for each PLO and an item analysis of the test results. These were then discussed by the department’s assessment committee with an eye towards whether PLO scores improve from measurement to measurement.

1. **Provide a summary of the results/conclusions from the assessment of each measured Program Learning Outcome.**

*Data:*

Test 1 (Fall 2022):

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Inchoate |  | Emerging |  | Developed |  | Mastered |
| PLO 1 | 4 |  | 4 |  | 1 |  | 0 |
| PLO 2 | 4 |  | 4 |  | 1 |  | 0 |
| PLO 3 | 6 |  | 2 |  | 1 |  | 0 |
| PLO 4 | 7 |  | 1 |  | 1 |  | 0 |
| PLO 6 | 2 |  | 2 |  | 4 |  | 1 |

Test 1 (Spring 2023)’

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Inchoate |  | Emerging |  | Developed |  | Mastered |
| PLO 1 | 4 |  | 5 |  | 0 |  | 0 |
| PLO 2 | 4 |  | 4 |  | 1 |  | 0 |
| PLO 3 | 8 |  | 1 |  | 0 |  | 0 |
| PLO 4 | 5 |  | 2 |  | 2 |  | 0 |
| PLO 6 | 1 |  | 1 |  | 5 |  | 2 |

Test 2 (Fall 2022)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Inchoate |  | Emerging |  | Developed |  | Mastered |
| PLO 1 | 1 |  | 3 |  | 0 |  | 0 |
| PLO 2 | 2 |  | 0 |  | 2 |  | 0 |
| PLO 3 | 0 |  | 4 |  | 0 |  | 0 |
| PLO 4 | 2 |  | 1 |  | 1 |  | 0 |

Test 2 (Spring 2023)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Inchoate |  | Emerging |  | Developed |  | Mastered |
| PLO 1 | 1 |  | 1 |  | 0 |  | 0 |
| PLO 2 | 1 |  | 1 |  | 0 |  | 0 |
| PLO 3 | 0 |  | 2 |  | 0 |  | 0 |
| PLO 4 | 0 |  | 2 |  | 0 |  | 0 |

Test 3 (Spring 2023)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Inchoate |  | Emerging |  | Developed |  | Mastered |
| PLO 1 | 1 |  | 0 |  | 1 |  | 0 |
| PLO 2 | 1 |  | 1 |  | 0 |  | 0 |
| PLO 3 | 1 |  | 0 |  | 1 |  | 0 |
| PLO 4 | 0 |  | 1 |  | 0 |  | 1 |
| PLO 5 | 0 |  | 2 |  | 0 |  | 0 |

Conclusions: The data seems to indicate not much development between the first and second tests. Math 206 is a cognate course for a number of majors, but Math 208 and 408 are major courses for just BS Mathematics and BS Math Ed programs. Individual data on students grouped by major seem to show that STEM majors taking Math 208 as a cognate course are often the stronger students in that course.

Graduation Competencies: Using the table suggested by Dr. Ladner, PLO 1 is related to GC 1a, 2d; PLO 2 is related to GC 1, 2a, 2b, 2d, 4a; PLO 3 is related to GC 1a, 2b, 2d; PLO 4 is related to GC 1a, 2a, 2b, 2d, 4a; PLO 5 is related to GC 1a, 2a, 2b, 2d, 4a; and PLO 6 is related to GC 1a, 2b, 2d, 4a. Based on the results of Test 3, the students at the end of the program overall are at the "Developed" or "Mastered" level in regards to GC 1, 2a, 2b, 2d and 4a but at a lower level for the others.

1. **What are next steps?** (e.g., will you measure this same learning outcome again? Will you change some feature of the classroom experience and measure its impact? Will you try a new tool? Are you satisfied?)

The above outcomes will continue to be measured every year. A new instrument to directly measure PLO 7 is being created.

We are going to try to have students complete the General Education Quantitative Literacy test in Math 408 (Senior Seminar) to get direct measurements of GC 2b and 2d.

1. **Please attach an example of the assessment tool used to measure your PLO(s).** These can be added as an appendix, a link to the assessment, or sent separately in email with your report.







