



Mathematics | 2016-2017 Assessment Report

Please give a brief overview of the assessment data you collected this year.

The assessment data was collected through

- MATH 328 Introduction to Algebraic Structures for fall 2016
- MATH 385 Foundations of Geometry for spring 2017

They are required courses for Mathematics majors with a Mathematics emphasis and an elective course for Mathematics minors with a Mathematics emphasis. The following outcomes were assessed:

LO1. Mathematics majors will be able to understand the important mathematical/statistical concepts, theorems, formulas, computational techniques and axiomatic systems in the required courses.

LO2. Mathematics majors will be able to demonstrate the ability to follow, construct, and write mathematical proofs.

LO4. Mathematics majors will be able to pose mathematical/statistical problems, and select and apply appropriate mathematical/statistical theories, models and tools to solve and/or analyze the problems.

MATH 328 Introduction to Algebraic Structures for fall 2016

1. It includes interdisciplinary contents that explore many topics within mathematics including Calculus, Linear Algebra, Number Theory, Topology, and Geometry. Students will apply them to the areas of Abstract Algebra. So, this course is a purely disciplinary course in Mathematics. It is problem-focused.
2. There were 11 students (1 junior and 10 seniors) who started the course for fall 2016. 10 students passed the course with grade C (1 student) and above. 1 student received a grade D.
3. 8 students were Mathematics majors with 1 or more other majors (Human Biology, Global Studies, Education, Business Administration, English, Environmental Science, Music, Computer Science). 3 students were Computer Science majors.
4. The assessment includes a combination of 6 assignments, 1 midterm, and the final.
5. All the assignments and exam problems are free-response, mostly consisting of proofs.
6. Students had to demonstrate the ability to follow, construct, and write mathematical proofs using knowledge derived from the major content areas of Abstract Algebra (Group Theory, Ring Theory, Vector Spaces, and Field Theory).

MATH 385 Foundations of Geometry for spring 2017

1. It includes interdisciplinary contents that explore many topics within mathematics including Calculus, Linear Algebra, Analysis, Number Theory, Topology, and Geometry (Euclidean and Non-Euclidean).

Students will apply them to the areas of History (Mathematics), Hyperbolic Space (Physics & Astronomy), transformation (picture distortion), Chaos Theory, Projective geometry (drawings), etc. So, several questions span across the semester.

2. It is problem-focused and students will write a lot of (mathematical) proofs. It will be a course for Capstone experiences starting next academic year (approved).
3. There were 9 students (2 juniors and 7 seniors) who started the course for spring 2017 and all 9 students passed the course with grade C (1 student) and above.
4. All 9 students were Mathematics majors with 1 or more other majors (Education, Accounting, Humanistic Studies, Business Administration, Economics, English, Environmental Science, and Computer Science).
5. The assessment includes a combination of 5 assignments, 1 midterm, and the final.
6. All the assignments and exam problems are free-response, mostly consisting of proofs.
7. Students had to demonstrate the ability to follow, construct, and write mathematical proofs using knowledge derived from the major content areas of Calculus, Number Theory, Linear Algebra, and Geometry (Euclidean and Non-Euclidean).

How will you use what you've learned from the data that was collected?

MATH 328 Introduction to Algebraic Structures for fall 2016

1. The students achieved an average score of 84.0%
2. The data shows that 9 out of 11 students were clear in understanding about most of the important concepts and skills. Their skills at proof writing were sufficient. 2 students needed to pay more attention to their weekly assignments and attendance.
3. 7 students who had 60 or 70 out of 70 attendance points achieved 87.3% or higher. 2 students who had 30 out of 70 attendance points achieved 70.7% or 76.9%. 2 students who had 10 or 20 out of 70 attendance points achieved 58.7% or 65.1%. Therefore, we concluded that a student's performance in the course had a strong positive correlation with their attendance.
4. The implementation of LO1, LO2, LO4 were satisfactory for fall 2016.

MATH 385 Foundations of Geometry for spring 2017

1. The average score that the students achieved was 90.4%
2. The data shows that all of the students were clear in understanding about most of the important concepts and skills. Their skills at proof writing were very sufficient.
3. All LO1, LO2, LO4 were successfully implemented for spring 2017.