

Assessment Report Quantitative Reasoning (MATH 1313)

The vision of the University of Arkansas Mathematical Sciences Department is to empower students to become mathematically proficient self-directed learners that will enable them to use quantitative reasoning and critical thinking skills to solve personal and societal problems. The mathematics core courses were designed with the following goals in mind:

1. Cultivate an appreciation of mathematical concepts and processes as powerful tools with broad applications in a societal and technological context.
2. Develop a recognition of mathematics as an abstract formal system that reflects and describes the physical world.
3. Enable students to solve problems and understand the world using quantitative and critical thinking skills.

Learning Outcome Indicators: Upon completion of three hours of mathematics courses, students will be able to:

- (MATH LO1) Demonstrate an understanding of college-level mathematical concepts and tools.
- (MATH LO2) Demonstrate fluency with the language and notation of mathematics.
- (MATH LO3) Formulate and solve a problem in mathematical terms, using appropriate tools and methods.
- (MATH LO4) Formulate decisions and solutions based on critically thinking, reasoning and analysis.
- (MATH LO5) Develop models to solve real-life problems.
- (MATH LO6) Express quantitative and logical ideas with precision.

Assessment of Student Learning Outcomes

Assessment in MATH 1313 consists of a sample of questions from the Final Exam and the three term exams, which are uniform for all sections of the course.

MATH 1313 Exams question themes are included below keyed to learning outcomes.

1. Understand how to work with units and perform unit conversions to formulate real-life decisions. (LO1; LO4; LO6)
2. Work with percentages and make interpretations in real-world contexts (LO2; LO3)
3. Solve problems relating to the value of money over time. (LO4; LO5; LO6)
4. Represent data in various forms and make interpretations from scatterplots. (LO2; LO4; LO6)
5. Create, analyze, and interpret graphs of functions in a real-world context. (LO1; LO2; LO3; LO4)

6. Understand the difference between linear and exponential growth/decay and solve application problems involving linear and exponential growth/decay. (LO1; LO3; LO4; LO5; LO6)
7. Solve application problems involving geometric notions such as the Pythagorean Theorem, scaling laws, calculating, and reasoning about areas of irregular shapes. (LO1; LO2; LO3; LO4; LO5; LO6)

Assessment of Student Learning Outcomes Spring 2022

During Spring 2022 the general education learning outcome (GELO) and its specific indicators as described above on Page 1 were measured on a 0–4-point scale to ascertain the level in which the students are mastering these learning outcomes. Students’ overall course grade based upon their homework, quizzes, 3 term exams, and the Final was used to determine students’ mastery of learning outcomes. It should be noted that only students who earn a 2, 3, or 4 as their GELO score will be considered mastering the learning outcome.

Below is the description of the 4-point Scale used measure the mastery of the learning outcomes:

Scale (Implementing the Assessment Process, 2022, p.1)

- A score of 4 represents outstanding achievement that signifies the highest level of mastery that can reasonably be expected from a student. The score demonstrates that the student’s performance significantly exceeds standards (commonly 90-100%)
- A score of 3 represents good achievement that signifies a high level of attainment expected from a student. The score demonstrates that the student’s performance exceeds standards (commonly 80-89%)
- A score of 2 represents average achievement that signifies an acceptable level of performance expected from a student. The score demonstrates that the student’s performance meets standards (commonly 70-79%)
- A score of 1 represents poor achievement. The score signifies marginal performance that is below standards (commonly 60-69%)
- A score of 0 indicates no achievement. This score signifies that student has not yet achieved this learning outcome (commonly 0-59%)

GELO results: In Spring 2022 there were 5 sections offered for Math 1313 with a total of 154 students enrolled in the course. Below in Table 1 is the breakdown of the students’ mastery of the learning outcomes at different levels:

Table 1

#Students	GELO 4	GELO 3	GELO 2	GELO 1	GELO 0	GELO (4-2)
154	52	46	32	10	14	130
	33.80%	29.90%	20.80%	6.50%	9.10%	84.40%

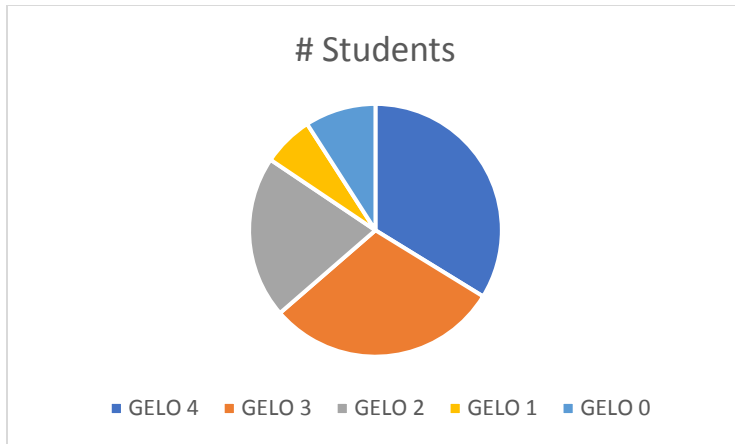


Figure 1

As indicated in Table 1 and Figure 1, we can see that 130 students out of 154 (84.4%) received a GELO score of 2, 3, or 4 thereby mastering the learning outcomes. We can also see the different levels at which this mastery was achieved. Almost 64% of the students either exceeded or significantly exceeded the standards while about 21% of the students mastered the learning outcomes with their performance meeting the standards.

We should also note that 24 students out of 154 (15.6%) were not able to master the learning outcomes. Out of these 6.5% of the students received the GELO score of 1 indicating an overall course average of D which signifies marginal performance that is below standards. About 9% of the students received the GELO score of 0 indicating an overall course grade of F or W.

References

Implementing the Assessment Process for the University of Arkansas General Education Learning Outcomes Spring 2022