Assessment Data Mathematical, Information and Computer Sciences
Cross-Disciplinary Studies Mathematics

Learning Outcome:

MTH213: Fundamentals of Elementary Mathematics I

- Students will be able to demonstrate a facility with operations on the integers (1b, 1c).
- Students will be able to demonstrate a facility with operations on the rational numbers (1b, 1c).
- Students will be able to apply concepts from number theory to solve problems (1a, 1b, 1c).

MTH223: Fundamentals of Elementary Mathematics II

- Students will be able to construct geometric figures using a compass and straight edge (1b, 1c).
- Students will be able to select and use the appropriate units for computing length, area and volume (1b, 1c).
- Students will be able to distinguish between the appropriate uses of probability and statistics to solve problems (1a, 1b, 1c).

Outcome Measure:
The learning outcomes are measured by placing standard problems in the final exams for each of the two courses.

Criteria for Success:
Average class score of 2.5 or higher for each problem. Note that all students' work is scored because the School of Education needs a score for each student as part of their compliance reporting.

0 Unsatisfactory - Completely Incorrect
1 Low Satisfactory - Missed more than one key concept or step
2 Satisfactory - Missed one key concept or step
3 High Satisfactory - Made a minor error
4 Outstanding - Completely correct

Longitudinal Data:

MTH213

	Students will be able to demonstrate a facility with operations on the integers (1b, 1c).	Students will be able to demonstrate a facility with operations on the rational numbers (1b, 1c).	Students will be able to apply concepts from number theory to solve problems (1a, 1b, 1c).
Fall 2008	3.40	2.96	3.16
Fall 2009	3.96	3.67	3.00
Fall 2010	3.78	4.00	3.66
Fall 2011	3.07	3.61	2.70
Fall 2012	3.28	3.72	2.93
Fall 2013	3.29	3.44	3.47
Fall 2014	**3.02**	**3.73**	**2.98**
Fall 2015	**2.39**	**3.23**	**2.42**
Fall 2016	**2.61**	**3.44**	**2.14**

*Bold classes taught using blended pedagogy

MTH223

	Students will be able to construct geometric figures using a compass and straight edge (1b, 1c).	Students will be able to select and use the appropriate units for computing length, area and volume (1b, 1c).	Students will be able to distinguish between the appropriate uses of probability and statistics to solve problems (1a, 1b, 1c).
Spring 2009	4.00	3.11	3.78
Spring 2010	2.32	3.25	3.86
Spring 2011	3.29	3.03	1.81
Srping 2012	2.78	2.50	2.30
Spring 2013	3.70	3.03	1.80
Spring 2014	3.39	2.78	3.58
Spring 2015	**3.59**	**2.45**	**3.57**
Spring 2016	**2.57**	**3.07**	**3.57**
Spring 2017	**1.53**	**2.10**	**2.71**

*Bold classes taught using blended pedagogy

Conclusions Drawn from Data:

It is interesting to note that the course sequence was changed to be blended (50% online) in the 2014-15 academic year. Student outcomes appear to have remained roughly constant between the two types of pedagogy. We are seeing some variation in the learning outcomes but it is not

clear if it is due to pedagogy or simply the variation in the students in the courses. We are continuing to monitor the learning outcomes.

Students appear to have some challenges in number theory and in measurements.

Changes to be Made Based on Data:
The class is now being taught in a blended format and the material covered is aligned with the Common Core. We need to continue to monitor students' ability to learn with a blended format. We are finding (via surveys) that students are spending much more time on task with the blended format, but they are also complaining about "having to teach themselves."

Rubric Used

MTH213 Cross Disciplinary Studies Learning Outcomes Rubric

	Unsatisfactory	Low Satisfactory	Satisfactory	High Satisfactory	Outstanding
Students will be able to demonstrate a facility with operations on the integers (1b, 1c).	Completely incorrect	Missed more than one key step or concept	Missed one key step or concept	Made a minor error	Completely correct
Students will be able to demonstrate a facility with operations on the rational numbers (1b, 1c).	Completely incorrect	Missed more than one key step or concept	Missed one key step or concept	Made a minor error	Completely correct
Students will be able to apply concepts from number theory to solve problems (1a, 1b, 1c).	Completely incorrect	Missed more than one key step or concept	Missed one key step or concept	Made a minor error	Completely correct

MTH223 Cross Disciplinary Studies Learning Outcomes Rubric

	Unsatisfactory	Low Satisfactory	Satisfactory	High Satisfactory	Outstanding
Students will be able to construct geometric figures using a compass and straight edge (1b, 1c).	Completely incorrect	Missed more than one key step or concept	Missed one key step or concept	Made a minor error	Completely correct
Students will be able to compute area and volume (1b, 1c).	Completely incorrect	Missed more than one key step or concept	Missed one key step or concept	Made a minor error	Completely correct
Students will be able to use probability and statistics to solve problems (1a, 1b, 1c).	Completely incorrect	Missed more than one key step or concept	Missed one key step or concept	Made a minor error	Completely correct