

University of Minnesota Morris Digital Well

University of Minnesota Morris Digital Well

Assessment of Student Learning Reports

Assessment of Student Learning Committee
(Inactive)

Spring 2015

Mathematics Discipline Assessment Report 2014/2015

Mathematics Discipline

Follow this and additional works at: https://digitalcommons.morris.umn.edu/aslc_reports

Recommended Citation

Mathematics Discipline, "Mathematics Discipline Assessment Report 2014/2015" (2015). *Assessment of Student Learning Reports*. 201.

https://digitalcommons.morris.umn.edu/aslc_reports/201

This Report is brought to you for free and open access by the Assessment of Student Learning Committee (Inactive) at University of Minnesota Morris Digital Well. It has been accepted for inclusion in Assessment of Student Learning Reports by an authorized administrator of University of Minnesota Morris Digital Well. For more information, please contact skulann@morris.umn.edu.

Mathematics Discipline Annual Report 2014–2015

Math Discipline

1. Mathematics PSLOs

In fall 2014, the discipline revised our Program Student Learning Outcomes (PSLOs).

The mathematics curriculum is designed to:

1. provide students with the basic knowledge and skills to make mathematical contributions to modern society,
2. help students develop competence in problem-solving, mathematical techniques and methods, and quantitative literacy,
3. sharpen students' mathematical intuition and abstract reasoning,
4. encourage and stimulate the type of independent and critical thinking required for research beyond the confines of the textbook, and
5. enable students to do in-depth and independent mathematics-related research projects that require students to integrate their mathematical knowledge from different areas, and to enhance their communication skills by way of written reports and oral presentations.

The curriculum prepares students to enter graduate school, pursue careers in applied mathematics, or teach mathematics.

2. Assessment of PSLO 5 in Math 4901 Senior Seminar

Minutes from Faculty Discussion on May 6, 2015

Twelve students completed their senior seminar in 2014/2015 (one fall 2014 and eleven spring 2015). No students needed to extend their senior seminar to a third semester.

Detailed rubrics faculty use for assessing the paper and presentation are shared with students before they begin work.

One of the strengths of the math senior seminar is that every student can gain something from the process of completing a paper and presentation and stretching their mathematical abilities, whatever their abilities are. This was an especially successful year of senior seminar, in which most students produced high quality papers and presentations.

The participation of the students was deemed exemplary as a whole. Most students met once a week with their advisor, and were able to work independently on their own between meetings. A few students had exemplary participation, accomplishing a great deal between meetings and moving the project forward strongly on their own accord. One student had mediocre participation in the first semester, but in the second semester worked very hard to complete their seminar. Another student was on track for a very good seminar in the first

semester, but in the second semester did not communicate with their advisor and did not build on their work from the fall, resulting in a weak paper and presentation.

The majority of the presentations varied from exemplary to very good, with one presentation that was borderline acceptable. Most students rehearsed extensively, and incorporated feedback from faculty who viewed their rehearsals into their presentation. A few students had strong presentations and made obvious efforts to make their work accessible to the audience, even if the topic was challenging. The borderline acceptable presentation suffered from poor mechanics of speaking and did not attempt to engage with the audience.

The final papers were deemed exemplary as a whole. As a whole, students responded to suggestions from the faculty meeting and their final papers were significantly improved over the near final drafts.

There were no systemic concerns that arose. Faculty will continue to inform students of the assessment criteria, both as individual advisors and by the senior seminar coordinator. Two areas were mentioned for emphasis in the future:

- Students sometimes have excessive definitions at the beginning of their paper, which makes the paper difficult to read. Early in the writing process, faculty should continue to advise students to streamline their papers, through paraphrasing and eliminating unnecessary details.
- Faculty should continue to encourage students to engage the audience during the oral presentations. The audience should be seen as active participants in the presentation and not passive listeners.

Table 2.1: Final Grade Distribution for Senior Seminar

A	A-	B+	B	B-	C+	C	C-	D+	D	F	K
4	5	2				1					

Table 2.2 The mean (standard deviation) of the data from the faculty assessment of the students presentations. (1-unacceptable, 2-borderline, 3-acceptable, 4-very good, 5-exemplary).

All Students	2014/15	2013/14
1. Mastery of Material	4.31 (0.72)	3.90 (0.91)
2. Planning and Organization	4.26 (0.84)	3.95 (0.94)
3. Effectiveness of Speech and Media Use	4.19 (0.93)	3.97 (0.77)
4. Appropriate Depth and Level of Talk	4.27 (0.72)	3.81 (0.90)

3. Placement Exam

Table 3.1 contains placement exam data and subsequent student success in math courses during the fall. Beginning with registration for fall 2014, placement exam and prerequisites for Math 1012, 1013, 1101, 1021 are being enforced.

- Enforced prerequisites has resulted in a significant reduction in the number of students taking a class above their math placement (down from 40 in fall 2013 to 10 in fall 2014). There will continue to be a few students who take a course above their placement due to having transfer or AP course credit, but these students are strongly cautioned about going above their placement during summer registration.
- There are still a few students who take a class below their placement (9 in fall 2013 and 8 in fall 2104). Students need permission to enroll in a class below their placement, and permission is granted if the situations warrants after discussion with the student.
- During fall 2014, 8 students retook the placement during orientation, and all improved. Four of the eight moved from Basic Algebra to Calculus, two moved from Basic Algebra to Precalculus, and two moved from Precalculus to Calculus.
- During spring 2014, the enforcement of placement had to be turned off to allow current students to register for fall 2014. In the future this will not be necessary, and we should see far fewer students at the sophomore level or above without placement in these courses.
- The number of freshmen (by credit) who had no placement (the final column in the Table) contains students who are PSEO, have some transfer credit, or are in their second year at UMM but do not have enough credits to be classified as sophomores. All these students are encouraged to take the placement exam if their situation warrants. This number has also decreased (from 43 fall 2013 to 19 fall 2014).
- The Table has grades split into A,B and C,S since a C grade in a prerequisite course such as Basic Algebra or Precalculus often does not translate to success in future courses.

Table 3.1: Placement advice during summer 2014 and resulting course grades after Fall 2014. Student should be successful along the diagonal (highlighted).

		Recommended Math Course(s)						Freshmen (by credit) with No Placement Advice Given in Summer	
Fall 2014		Basic Algebra	Precalculus I and Precalculus II	Precalculus I	Precalculus II or Survey of Calculus	Survey of Calculus or Calculus I			
Course Taken	Basic Algebra	35 2.13 12 13 8 2	3 3.11 3 0 0 0				6 2.89 5 1 0 0		
	Precalculus II Trig		9 2.48 5 2 2 0		6 3.44 2 4 0 0	1 3.33 1 0 0 0	1 0.00 0 0 0 1		
	Precalculus I Functions	4 2.67 0 3 1 0	38 2.33 17 16 2 3	6 2.28 3 0 3 0	2 3.67 2 0 0 0	2 2.67 1 1 0 0	4 1.67 2 0 1 1		
	Survey of Calculus			1 1.67 0 1 0 0	2 3.50 2 0 0 0	12 2.57 11 1 0 0			
	Calculus I		2 2.17 1 0 1 0	1 1.33 0 0 1 0	2 2.67 2 0 0 0	54 2.57 35 7 8 4	8 2.71 5 2 0 1		

Cell Legend:

# students		Avg. GPA	
# A,B grades	# C,S grades	# D,F,N,I grades	# W grades

- Avg. GPA: An “I” grade is not included in the GPA. N,W are given 0.0 GP and S is given 2.0 GP.
- A student waiting on AP calculus test results should take placement; during registration we discuss what class they should take based on placement and AP test.

4. Effectiveness of Lower Level Prerequisite Courses

In previous years we have tracked the effectiveness of lower level courses by examining students grades from fall to spring (for example, from Math 1012 Precalculus I Functions in fall to Math 1101 Calculus I in spring). The results of this analysis have been consistent in recent years:

- Students who have a C or better in a prerequisite course in the fall are generally successful if they take the next math course in the spring semester.
- Students who are not successful in a prerequisite course tend to stop taking math.
- There are still too many students who earn a C or above in a prerequisite course and do not continue to the next math course in the sequence. This is a concern since any break in taking these courses leads to a deterioration of skills. This happens most often for biology and pre-professional program students. Students should complete the math requirements for their major as soon as possible.

With the implementation of enforced prerequisites in lower level courses the discipline feels this assessment is not necessary moving forward.

5. Assessment Activities for 2015/16

- Track the effectiveness of the math placement exam.
- Assess PSLO 5 in Math 4901 Senior Seminar.
- Assess PSLO 2 using a rubric which was developed in 2014/2015 in
 - Math 1102 Calculus II,
 - Math 2101 Calculus III, and/or
 - Math 2111 Linear Algebra.
- Develop assessment plans for PSLO 3 which will be implemented in 2016/17 in
 - Math 2202 Math Perspectives,
 - Math 3221 Real Analysis I, and/or
 - Math 3231 Abstract Algebra I.
- UMM Academic Program Review Self-Study