

# University of Louisiana at Lafayette

## Detailed Assessment Report 2015-2016 Mathematics BS

As of: 11/03/2016 03:41 PM CENTRAL

(Includes those Action Plans with Budget Amounts marked *One-Time, Recurring, No Request.*)

### Mission / Purpose

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The Department of Mathematics takes as its primary missions the advancement and dissemination of mathematical thinking and knowledge through research and teaching. This includes the training of graduate students to demonstrate the ability to produce original research results, and the training of undergraduate majors for a wide variety of career options. It also includes equipping students in client disciplines such as the natural sciences, engineering, education, and business with the mathematical tools necessary for success. A more general mission is to empower all graduates of the University with a level of mathematical literacy and skill which will enable them to better understand and think critically about complex problems and issues which will confront them in our society.

### Student Learning Outcomes/Objectives, with Any Associations and Related Measures, Targets, Findings, and Action Plans

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#### **SLO 1: Expression of Mathematical Ideas**

Upon completion of the program, a student majoring in mathematics should demonstrate the ability to express nontrivial mathematical ideas in a coherent, comprehensible, and correct manner as evidenced through the presentation of a proof or analysis of an applied problem.

#### **Connected Document**

[Rubrics](#)

#### **Related Measures**

#### **M 1: Evaluation of Proof or Analysis of Problem**

A sample of student work from a class assignment, an exam, or a presentation will be evaluated by two or more faculty using a common rubric. The number of samples evaluated for a particular student is limited to two different courses and no more than two items within each course. See attachments for rubric.

Samples of student's work will be collected from various junior-level or senior-level courses in which the student is enrolled. As the student enrolls in courses suitable for evaluation, work will be collected and results compiled upon the student's graduation. The percentage of graduates who are rated "Excellent" or "Satisfactory" for this SLO will be computed in May of each year.

If a student did not demonstrate competency with one sample, the committee may try to obtain another sample to evaluate. Sometimes it is possible to get more than

one exercise/problem from the same course. The committee decided to limit the evaluated samples for a particular student to two different courses per outcome and will examine no more than two or three samples within each course.

Number of students assessed = All mathematics seniors for 2015-2016

Source of Evidence: Written assignment(s), usually scored by a rubric

**Target:**

Definition of Success: At least 70% of the graduates in mathematics during the academic year receive ratings of "Excellent" or "Satisfactory".

**Finding (2015-2016) - Target: Not Met**

For the 2015-2016 academic year, we evaluated the final exams of 6 out of the 7 students who either graduated in Fall 2015 or in Spring 2016 with a BS in Mathematics. Out of the 6 graduating seniors evaluated, 3 out of 6, or 50% scored Excellent or Satisfactory on this outcome. The 7th graduating senior was not evaluated because his final exam was misplaced.

**Related Action Plans (by Established cycle, then alpha):**

**Strengthen the Student's Ability to Express Mathematical Ideas Through a Proof**

Although the target was met, we discovered a weakness in our students' abilities to provide strong proofs on their Linear Algebra final exam. This was particularly true with concepts that involve inverse image of a function. We will increase emphasis on this topic in Fundamentals of Mathematics, the original course where constructing proofs is taught. The professor teaching Linear Algebra will be encouraged to require more work from the students on this subject.

**Established in Cycle:** 2012-2013

**Implementation Status:** Finished

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Evaluation of Proof or Analysis of Problem |

**Outcome/Objective:** Expression of Mathematical Ideas

**Implementation Description:** Meetings will take place among professors teaching the two courses and representatives of the Department of Mathematics Assessment Committee.

**Projected Completion Date:** 12/2013

**Responsible Person/Group:** Kathleen Lopez

**Additional Resources:** None

**Regular Meetings of the Departmental Assessment Committee**

Starting in the Fall of 2014, we will plan a minimum of one Assessment Committee meeting per semester to discuss the department's progress in succeeding in the stated outcomes. We will score students on the outcomes every semester instead of just once a year.

**Established in Cycle:** 2013-2014

**Implementation Status:** Finished

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Evaluation of Proof or Analysis of Problem |

**Outcome/Objective:** Expression of Mathematical Ideas

**Responsible Person/Group:** Ross Chiquet/ Departmental Assessment Committee

**Regular Meetings of the Departmental Assessment Committee**

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**Established in Cycle:** 2013-2014

**Implementation Status:** Finished

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Evaluation of Calculus Problem from Upper Level Course | **Outcome/Objective:** Use of Calculus in Advanced Courses

**Measure:** Evaluation of Proof or Analysis of Problem | **Outcome/Objective:** Expression of Mathematical Ideas

**Responsible Person/Group:** Ross Chiquet/ Departmental Assessment Committee

**Distribute Rubric in Math 462, Linear Algebra**

Copies of the rubric for this outcome will be provided to faculty and to students in Math 462, Linear Algebra. This course is used to measure a student's success for this outcome. By distributing the rubric, the instructor in the course and the students will know exactly what is to be expected of them in terms of assessment for the department.

**Established in Cycle:** 2015-2016

**Implementation Status:** In-Progress

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Evaluation of Proof or Analysis of Problem |

**Outcome/Objective:** Expression of Mathematical Ideas

**Measure:** Evaluation of Student Work from Linear Algebra |

**Outcome/Objective:** Linear Algebra Understanding

**Responsible Person/Group:** Ross Chiquet

**Regular Meetings of the Departmental Assessment Committee**

For the upcoming cycle of 2016-2017, we will plan a minimum of one Assessment Committee meeting per semester to discuss the department's progress in succeeding in the stated outcomes. We will score students on the outcomes every semester instead of just once a year.

**Established in Cycle:** 2015-2016

**Implementation Status:** In-Progress

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Evaluation of Calculus Problem from Upper Level Course | **Outcome/Objective:** Use of Calculus in Advanced Courses

**Measure:** Evaluation of Proof or Analysis of Problem |

**Outcome/Objective:** Expression of Mathematical Ideas  
**Measure:** Evaluation of Student Work from Linear Algebra |  
**Outcome/Objective:** Linear Algebra Understanding

**Responsible Person/Group:** Ross Chiquet/ Departmental Assessment Committee

**Review and possibly increase the level for success for our measures**

For the three measures we use as a department for assessment, we have met our goal almost every cycle for all three of our measures. The department's assessment committee will review the levels we have established for our measures to be "met" and possibly increase the values from 70% to have met our goal for a measure to possibly 75 or 80%. This will take place in the Fall 2016.

**Established in Cycle:** 2015-2016

**Implementation Status:** In-Progress

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Evaluation of Calculus Problem from Upper Level Course | **Outcome/Objective:** Use of Calculus in Advanced Courses

**Measure:** Evaluation of Proof or Analysis of Problem |  
**Outcome/Objective:** Expression of Mathematical Ideas  
**Measure:** Evaluation of Student Work from Linear Algebra |  
**Outcome/Objective:** Linear Algebra Understanding

**Responsible Person/Group:** Ross Chiquet and the department's Assessment Committee

**SLO 2: Linear Algebra Understanding**

Upon completion of the program, a student majoring in mathematics should demonstrate understanding of the core concepts of linear algebra, specifically linear independence, vector spaces, linear transformations, and eigenvectors.

**Connected Document**

[Rubrics](#)

**Related Measures**

**M 2: Evaluation of Student Work from Linear Algebra**

A sample of student work from a class assignment, an exam, or a presentation will be evaluated by two or more faculty using the appropriate common rubric. See attachments for rubrics.

Linear Algebra (MATH 462) is a required course for all mathematics majors. In most cases, the student's final exam will be evaluated. Other assignments or exam from the course may also be used. When the student enrolls in Linear Algebra (Math 462), work will be collected and results compiled upon the student's graduation. The percentage of graduates who are rated "Excellent" or "Satisfactory" for this SLO will be computed in May of each year.

Samples of student's work will be collected from various junior-level or senior-level courses in which the student is enrolled. As the student enrolls in courses suitable for evaluation, work will be collected and results compiled upon the student's graduation. The percentage of graduates who are rated "Excellent" or "Satisfactory" for this SLO

will be computed in May of each year.

If a student did not demonstrate competency with one sample, the committee may try to obtain another sample to evaluate. Sometimes it is possible to get more than one exercise/problem from the same course. The committee decided to limit the evaluated samples for a particular student to two different courses per outcome and will examine no more than two or three samples within each course.

Number of students assessed = All mathematics seniors for 2015-2016

Source of Evidence: Written assignment(s), usually scored by a rubric

**Target:**

Definition of Success: At least 70% of the graduates in mathematics during the academic year receive ratings of "Excellent" or "Satisfactory".

**Finding (2015-2016) - Target: Met**

For the 2015-2016 academic year, we evaluated the final exams of 6 out of the 7 students who either graduated in Fall 2015 or in Spring 2016 with a BS in Mathematics. Out of the 6 graduating seniors evaluated, 5 out of 6, or 83.3% scored Excellent or Satisfactory on this outcome. The 7th graduating senior was not evaluated because his final exam was misplaced.

**Related Action Plans (by Established cycle, then alpha):**

**Goal development**

Changed number of the SLO: from SLO2 to SLO1. Created New SLO that includes some common content knowledge.

**Established in Cycle:** 2009-2010

**Implementation Status:** Finished

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Evaluation of Student Work from Linear Algebra |

**Outcome/Objective:** Linear Algebra Understanding

**Implementation**

Assessment will be implemented in Fall 2010

**Established in Cycle:** 2009-2010

**Implementation Status:** Finished

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Evaluation of Student Work from Linear Algebra |

**Outcome/Objective:** Linear Algebra Understanding

**Rubric Development**

Created evaluation rubric with specific dimensions and descriptors.

The Department edited the evaluation rubrics to reflect descriptions of three levels of achievement – “Excellent”, “Satisfactory”, “Below

Expectations” rather than the former ones of “Meets Expectations”, “Fails to Meet Expectations”.

**Established in Cycle:** 2009-2010

**Implementation Status:** Finished

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Evaluation of Calculus Problem from Upper Level Course | **Outcome/Objective:** Use of Calculus in Advanced Courses

**Measure:** Evaluation of Student Work from Linear Algebra | **Outcome/Objective:** Linear Algebra Understanding

**Rubric Development and Distribution**

Created evaluation rubric with specific dimensions and descriptors.

Copies of both rubrics for this outcome will be provided to faculty and to students in MATH 462, Linear Algebra, the course from which the samples will be obtained.

**Established in Cycle:** 2009-2010

**Implementation Status:** Finished

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Evaluation of Student Work from Linear Algebra | **Outcome/Objective:** Linear Algebra Understanding

**Distribute Rubric in Math 462, Linear Algebra**

Copies of the rubric for this outcome will be provided to faculty and to students in Math 462, Linear Algebra. This course is used to measure a student's success for this outcome. By distributing the rubric, the instructor in the course and the students will know exactly what is to be expected of them in terms of assessment for the department.

**Established in Cycle:** 2015-2016

**Implementation Status:** In-Progress

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Evaluation of Proof or Analysis of Problem | **Outcome/Objective:** Expression of Mathematical Ideas

**Measure:** Evaluation of Student Work from Linear Algebra | **Outcome/Objective:** Linear Algebra Understanding

**Responsible Person/Group:** Ross Chiquet

**Regular Meetings of the Departmental Assessment Committee**

For the upcoming cycle of 2016-2017, we will plan a minimum of one Assessment Committee meeting per semester to discuss the

department's progress in succeeding in the stated outcomes. We will score students on the outcomes every semester instead of just once a year.

**Established in Cycle:** 2015-2016

**Implementation Status:** In-Progress

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Evaluation of Calulus Problem from Upper Level Course | **Outcome/Objective:** Use of Calculus in Advanced Courses

**Measure:** Evaluation of Proof or Analysis of Problem |

**Outcome/Objective:** Expression of Mathematical Ideas

**Measure:** Evaluation of Student Work from Linear Algebra |

**Outcome/Objective:** Linear Algebra Understanding

**Responsible Person/Group:** Ross Chiquet/ Departmental Assessment Committee

### **Review and possibly increase the level for success for our measures**

For the three measures we use as a department for assessment, we have met our goal almost every cycle for all three of our measures. The department's assessment committee will review the levels we have established for our measures to be "met" and possibly increase the values from 70% to have met our goal for a measure to possibly 75 or 80%. This will take place in the Fall 2016.

**Established in Cycle:** 2015-2016

**Implementation Status:** In-Progress

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Evaluation of Calulus Problem from Upper Level Course | **Outcome/Objective:** Use of Calculus in Advanced Courses

**Measure:** Evaluation of Proof or Analysis of Problem |

**Outcome/Objective:** Expression of Mathematical Ideas

**Measure:** Evaluation of Student Work from Linear Algebra |

**Outcome/Objective:** Linear Algebra Understanding

**Responsible Person/Group:** Ross Chiquet and the department's Assessment Committee

### **SLO 3: Use of Calculus in Advanced Courses**

Upon completion of the program, a student majoring in mathematics should demonstrate the ability to solve challenging problems using calculus in an advanced undergraduate mathematics course.

**Connected Document**

[Rubrics](#)

**Related Measures**

**M 3: Evaluation of Calulus Problem from Upper Level Course**



A sample of student work from a class assignment, an exam, or a presentation will be evaluated by two or more faculty using a common rubric. The number of samples evaluated for a particular student is limited to two different courses and no more than two items within each course. See attachments for rubric.

Samples of student's work will be collected from various junior-level or senior-level courses in which the student is enrolled. As the student enrolls in courses suitable for evaluation, work will be collected and results compiled upon the student's graduation. The percentage of graduates who are rated "Excellent" or "Satisfactory" for this SLO will be computed in May of each year.

If a student did not demonstrate competency with one sample, the committee may try to obtain another sample to evaluate. Sometimes it is possible to get more than one exercise/problem from the same course. The committee decided to limit the evaluated samples for a particular student to two different courses per outcome and will examine no more than two or three samples within each course.

Number of students assessed = All mathematics seniors for 2015-2016

Source of Evidence: Written assignment(s), usually scored by a rubric

**Target:**

At least 70% of the graduates in mathematics during the academic year receive ratings of "Excellent" or "Satisfactory".

**Finding (2015-2016) - Target: Not Met**

For the 2015-2016 academic year, we evaluated the final exams of all 7 students who either graduated in Fall 2015 or in Spring 2016 with a BS in Mathematics. Out of the 7 graduating seniors evaluated, 4 out of 7, or 57% scored Excellent or Satisfactory on this outcome.

**Related Action Plans (by Established cycle, then alpha):**

**Reporting Period Adjustment**

Changed reporting period from calendar year to academic year to match other academic units.

**Established in Cycle:** 2009-2010

**Implementation Status:** Finished

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Evaluation of Calculus Problem from Upper Level Course | **Outcome/Objective:** Use of Calculus in Advanced Courses

**Rubric Development**

Created evaluation rubric with specific dimensions and descriptors.

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Expectations" rather than the former ones of "Meets Expectations", "Fails to Meet Expectations".



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**Implementation Status:** Finished

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**Relationships (Measure | Outcome/Objective):**

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**Measure:** Evaluation of Calculus Problem from Upper Level Course | **Outcome/Objective:** Use of Calculus in Advanced Courses

**Measure:** Evaluation of Proof or Analysis of Problem | **Outcome/Objective:** Expression of Mathematical Ideas

**Responsible Person/Group:** Ross Chiquet/ Departmental Assessment Committee

**Review the Calculus Courses and the Textbook**

Although our graduating students have been succeeding in meeting the requirements for this outcome, in the Fall of 2014 we will be doing a complete review of the Calculus courses (Calc I, II, and III). This will include a review of the syllabus, the selected homework, and the textbook we are currently using. This will hopefully further increase the success of our students in this outcome in the future.

**Established in Cycle:** 2013-2014

**Implementation Status:** Finished

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Evaluation of Calculus Problem from Upper Level Course | **Outcome/Objective:** Use of Calculus in Advanced Courses

**Responsible Person/Group:** Ross Chiquet/ Departmental Calculus Committee

**Distribute Rubric in Stat 425**

Copies of the rubric for this outcome will be provided to faculty and to students first in Stat 425. This course is used to measure a student's success for this outcome. By distributing the rubric, the instructor in the course and the students will know exactly what is to be expected of them in terms of assessment for the department.

**Established in Cycle:** 2015-2016

**Implementation Status:** In-Progress

**Priority:** High

**Relationships (Measure | Outcome/Objective):**

**Measure:** Evaluation of Calulus Problem from Upper Level Course | **Outcome/Objective:** Use of Calculus in Advanced Courses

**Responsible Person/Group:** Ross Chiquet

### **Regular Meetings of the Departmental Assessment Committee**

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**Established in Cycle:** 2015-2016

**Implementation Status:** In-Progress

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**Responsible Person/Group:** Ross Chiquet/ Departmental Assessment Committee

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**Responsible Person/Group:** Ross Chiquet and the department's Assessment Committee

## **Analysis Questions and Analysis Answers**

**How were assessment results shared and evaluated within the unit?**

The results from the current cycle will be shared with the departmental Assessment committee. These results will be compared to previous results to see if any changes need to be made.

**Identify which action plans [created in prior cycle(s)] were implemented in this current cycle. For each of these implemented plans, were there any measurable or perceivable effects? How, if at all, did the findings appear to be affected by the implemented action plan?**

For the last cycle, we distribute the rubrics in Math 360, Math 462, and Stat 425. This past cycle because of this we were able to get an accurate finding for all of our measures.

**What has the unit learned from the current assessment cycle? What is working well, and what is working less well in achieving desired outcomes?**

We learned that our students are still doing well with the outcomes that we have laid out. We still need to do a better job as a department to actually use the assessment that we are doing each year. We also need to do better at having regular meetings of the assessment committee so we can possibly come up with new ideas to improve our program.