

University of Louisiana at Lafayette

Detailed Assessment Report 2015-2016 Mathematics PhD

As of: 11/17/2016 11:45 AM CENTRAL

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

Mission / Purpose

The mission of the graduate program is to educate and prepare graduate students to make original contributions to mathematical sciences and to apply their knowledge to solve the important problems facing society.

The goal of the Ph.D. program is to provide the student with a preparation that has general breadth, and depth in a particular topic, that will enable the student to engage in (i) original research in the mathematical sciences; (ii) advanced application of mathematical knowledge and techniques in private industry or professional settings; (iii) teach advanced mathematics at the college and graduate level. In addition, the graduate will have already contributed original research to the corpus of mathematical knowledge.]

Our graduate program is committed to the following core values:

- Excellence in teaching and research;
- Discovery of new knowledge;
- Diversity in our students;
- Professional and personal integrity.

Our graduate program has been a central part of the teaching and research mission of our department, and is an important component of our long term planning. Our commitment to graduate education has enhanced our reputation.

Our focus on excellent education is consistent with the College and University's focus on facilitating quality teaching and learning. Our focus on students' preparation is consistent with the College and University's focus on serving and preparing our students. Our mission and values are consistent with those for graduate programs in mathematics nationwide.

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

SLO 1: Outcome 1: Breadth of Knowledge

A doctoral student in the degree program will demonstrate a breadth of content knowledge in the discipline and a depth of knowledge in his or her area of specialization.

Related Measures

M 1: Written Comprehensive examinations

Assessment Method: To demonstrate a breadth of knowledge, each candidate is required to pass four written comprehensive examination in a variety of content areas. Each exam is prepared and evaluated by a committee made up of at least three mathematics graduate faculty members who have expertise in that particular field. The committee follows a departmental rubric in evaluating the candidate's performance. Upon successful completion of these written exams, a candidate will demonstrate depth of knowledge by passing an oral exam in his or her area of research specialization. This exam is also given by a committee of at least three mathematics graduate faculty members with expertise in the field, and evaluated as described in the departmental rubric.

Number of students assessed = 0

Assessment Timeline January 2011 - May 2011

All students will be assessed when they take comprehensive exams.
All outcomes will be measured at least once per year.

Source of Evidence: Evaluations

Target:

Definition of Success: At least 75% of students who attempt written comprehensive exams in a calendar year will be given a rating which is at least satisfactory in accordance with the departmental rubric. At least 75% of students who attempt the oral exam will be given a rating which is at least satisfactory in accordance with the departmental rubric.

The first part of the new rubric does not apply. We will report the result accordingly next year. The second part of the new rubric has been achieved. Eight students took an oral exam in their area of research specialization. All of them satisfactorily passed the oral exam.

Finding (2015-2016) - Target: Met

Ten students sat for a total of 16 (sixteen) written comprehensive exams during this period. Thirteen of the exams (81.25%) resulted in a pass at the PhD level; two of the exams (12.5%) were failed at the PhD level but passed at the MS level; one exam (6.25%) was failed at both the PhD and MS levels.

The exams received forty individual ratings by examiners. Of these ratings, two (5%) were "Excellent", eight (20%) were "Highly Satisfactory", twenty two (55%) were "Satisfactory", five (12.5%) were "unsatisfactory", and three (7.5%) were "Highly unsatisfactory".

Eight students took their Oral Examination during this review cycle, with all of them passing the exam. All students received a rating of at least "Satisfactory" by all examiners. One student received ratings of "Satisfactory" by all examiners; two students were rated "Satisfactory" by two and "Highly satisfactory" by one of the examiners; three students were rated "Highly satisfactory" by two examiners and "Satisfactory" by one examiner; one student was rated "Highly satisfactory" by all three examiners; and one student was rated "Excellent" by one examiner and "Highly satisfactory" by two examiners.

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

Closing the loop for outcome 1

Explanation: Revised the goals and assessment methods.

Established in Cycle: 2009-2010

Implementation Status: Planned

Priority: High

Relationships (Measure | Outcome/Objective):

Measure: Written Comprehensive examinations |

Outcome/Objective: Outcome 1: Breadth of Knowledge

Creation of rubrics and reports

The Department created rubrics for the outcomes that were developed; forms were created to assess whether the goals were met, which are given to involved faculty. These are then collected and collated by the Graduate Coordinator, who follows up in the case of individual students who fail to meet the goal, and of patterns that may indicate weaknesses in the program.

Established in Cycle: 2010-2011

Implementation Status: Finished

Priority: High

Relationships (Measure | Outcome/Objective):

Measure: Dissertation Defense | **Outcome/Objective:**

Outcome 2: Ability to do original research

| Outcome 3: Presentation of Mathematical Research

Measure: Oral exams | **Outcome/Objective:** Outcome 1:
Breadth of Knowledge

Measure: Written Comprehensive examinations |

Outcome/Objective: Outcome 1: Breadth of Knowledge

Implementation Description: Forms and rubrics have been created and adjusted after a trial period, and are being used to assess the outcomes.

Responsible Person/Group: Committee on Assessment, Graduate Coordinator

Evaluation and tracking of goals

The Department has been using the rubrics and forms developed in Fall 2010 to evaluate adherence to the objectives and successful outcomes within the program. The rubrics are periodically reviewed. The outcomes inform the on-going review of requirements for students. The Graduate Coordinator distributes and collects the forms from Graduate Faculty, and collates the results, reporting them to the Assessment Committee.

Established in Cycle: 2011-2012

Implementation Status: In-Progress

Priority: High

Relationships (Measure | Outcome/Objective):

Measure: Dissertation Defense | **Outcome/Objective:**

Outcome 2: Ability to do original research

| Outcome 3: Presentation of Mathematical Research

Measure: Oral exams | **Outcome/Objective:** Outcome 1:
Breadth of Knowledge

Measure: Written Comprehensive examinations |

Outcome/Objective: Outcome 1: Breadth of Knowledge

Implementation Description: Graduate Coordinator distributes the evaluation/assessment forms, collates the results, and reports them to the Department's Assessment Committee

Responsible Person/Group: Graduate Coordinator

Additional Resources: None

Re-take of Oral exam

The two students who failed their oral exam on their first try re-took the exams in late May and early June. Both succeeded.

Established in Cycle: 2014-2015

Implementation Status: Finished

Priority: Medium

Relationships (Measure | Outcome/Objective):

Measure: Oral exams | **Outcome/Objective:** Outcome 1:
Breadth of Knowledge

Measure: Written Comprehensive examinations |

Outcome/Objective: Outcome 1: Breadth of Knowledge

Implementation Description: Two students retook the exam and passed it.

Projected Completion Date: 06/2015

Responsible Person/Group: Dissertation supervisors

Additional Resources: None

M 2: Oral exams

Assessment Method: A committee of at least three mathematics graduate faculty members will evaluate the dissertation, judging it on organization, originality, mathematical relevance, and mathematical validity.

Number of students assessed = 2

Assessment Timeline: January 2011 --May 2011

All students were assessed when they had their oral examination.

Source of Evidence: Evaluations

Target:

At least 75% of students who attempt the Oral Examination will be rated "satisfactory" or above by a committee consisting of at least three Graduate Faculty members, using the rubrics developed by the Department.

Finding (2015-2016) - Target: Met

The number of students taking the Oral Examination this semester rose from 5 in the last cycle to 8 in this cycle. Of 24 individual evaluations, one (4%) was "Exceptional", thirteen (54%) were "Highly satisfactory", and ten (42%) were "Satisfactory". There were no ratings below the "Satisfactory" level. This is an improvement over last year, when the objective was only partially met.

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

Creation of rubrics and reports

The Department created rubrics for the outcomes that were developed; forms were created to assess whether the goals were met, which are given to involved faculty. These are then collected and collated by the Graduate Coordinator, who follows up in the case of individual students who fail to meet the goal, and of patterns that may indicate weaknesses in the program.

Established in Cycle: 2010-2011

Implementation Status: Finished

Priority: High

Relationships (Measure | Outcome/Objective):

Measure: Dissertation Defense | **Outcome/Objective:**

Outcome 2: Ability to do original research

| Outcome 3: Presentation of Mathematical Research

Measure: Oral exams | **Outcome/Objective:** Outcome 1: Breadth of Knowledge

Measure: Written Comprehensive examinations |

Outcome/Objective: Outcome 1: Breadth of Knowledge

Implementation Description: Forms and rubrics have been created and adjusted after a trial period, and are being used to assess the outcomes.

Responsible Person/Group: Committee on Assessment, Graduate Coordinator

Evaluation and tracking of goals

The Department has been using the rubrics and forms developed in Fall 2010 to evaluate adherence to the objectives and successful outcomes within the program. The rubrics are periodically reviewed. The outcomes inform the on-going review of requirements for students. The Graduate Coordinator distributes and collects the forms from Graduate Faculty, and collates the results, reporting them to the Assessment Committee.

Established in Cycle: 2011-2012

Implementation Status: In-Progress

Priority: High

Relationships (Measure | Outcome/Objective):

Measure: Dissertation Defense | **Outcome/Objective:**
Outcome 2: Ability to do original research
| Outcome 3: Presentation of Mathematical Research
Measure: Oral exams | **Outcome/Objective:** Outcome 1:
Breadth of Knowledge
Measure: Written Comprehensive examinations |
Outcome/Objective: Outcome 1: Breadth of Knowledge

Implementation Description: Graduate Coordinator distributes the evaluation/assessment forms, collates the results, and reports them to the Department's Assessment Committee

Responsible Person/Group: Graduate Coordinator

Additional Resources: None

Better educate new faculty and students on Oral examination

To increase the success in oral examinations, the Department will engage on two fronts: (i) In the student front, the Graduate Coordinator will encourage students to engage in peer support through "mock oral exams", where students who have successfully completed the oral exam play the role of examiners for students who are preparing the oral exam, thus giving the latter a better idea of the format and content of the exam. (ii) In the faculty front, the Graduate Coordinator and more senior faculty will engage with junior faculty who is coming up through the ranks (and becoming dissertation supervisors for the first time) to give the latter a better idea of the format and expectations of the Oral Exam.

Established in Cycle: 2014-2015

Implementation Status: Planned

Priority: High

Relationships (Measure | Outcome/Objective):

Measure: Oral exams | **Outcome/Objective:** Outcome 1:
Breadth of Knowledge

Implementation Description: Engage with students during each semester's orientation meeting. Engage with faculty during the Graduate Faculty meeting.

Projected Completion Date: 05/2016

Responsible Person/Group: Student front: Graduate Coordinator
Faculty front: Graduate Coordinator and senior faculty as a whole

Additional Resources: None.

Re-take of Oral exam

The two students who failed their oral exam on their first try re-took the exams in late May and early June. Both succeeded.

Established in Cycle: 2014-2015

Implementation Status: Finished

Priority: Medium

Relationships (Measure | Outcome/Objective):

Measure: Oral exams | **Outcome/Objective:** Outcome 1:
Breadth of Knowledge

Measure: Written Comprehensive examinations |
Outcome/Objective: Outcome 1: Breadth of Knowledge

Implementation Description: Two students retook the exam and passed it.

Projected Completion Date: 06/2015

Responsible Person/Group: Dissertation supervisors

Additional Resources: None

Establishment of a culture for mock oral exams among students

Will attempt to establish a culture among students to prepare for the oral comprehensive examination through the use of "mock oral exams", given by fellow students. This should help prepare the students for what is a novel examination situation for most of them, and give them more confidence as they prepare for the exam.

Established in Cycle: 2015-2016

Implementation Status: In-Progress

Priority: Medium

Relationships (Measure | Outcome/Objective):

Measure: Oral exams | **Outcome/Objective:** Outcome 1:
Breadth of Knowledge

Implementation Description: Discuss with graduate students and strong encouragement during advising.

Projected Completion Date: 05/2017

Responsible Person/Group: Arturo Magidin

Additional Resources: None

SLO 2: Outcome 2: Ability to do original research

A doctoral candidate in the degree program will demonstrate the ability to contribute to the overall body of mathematical knowledge by successfully carrying out original research in the area of specialty and incorporating research results into a Ph.D. dissertation.

Related Measures

M 3: Dissertation Defense

Assessment Method: This outcome will be assessed by all of the above-mentioned committees, and by the dissertation committee when the candidate presents an oral dissertation defense. It will also be assessed by journal editors and referees.

Number of students assessed = 3

Assessment Timeline June 2011 - May 2012

All students will be assessed upon completion of dissertation.

All outcomes will be measured at least once per year.

Source of Evidence: Evaluations

Target:

At least 70% of students who defend their dissertation will be rated "satisfactory" or above by all examiners; the examiners will consist of at least three Graduate Faculty members, and they will rate the defense using the rubrics developed by the Department.

Finding (2015-2016) - Target: Met

There were four dissertation defenses during the review period; they included 14 individual ratings (two of the defenses had four examiners, two had three).

There were three (21.4%) ratings of "Exceptional", ten (71.4%) ratings of "Highly Satisfactory", and one (7.2%) of "Satisfactory".

The target was met and exceeded.

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

Creation of rubrics and reports

The Department created rubrics for the outcomes that were developed; forms were created to assess whether the goals were met, which are given to involved faculty. These are then collected and collated by the Graduate Coordinator, who follows up in the case of individual students who fail to meet the goal, and of patterns that may indicate weaknesses in the program.

Established in Cycle: 2010-2011

Implementation Status: Finished

Priority: High

Relationships (Measure | Outcome/Objective):

Measure: Dissertation Defense | **Outcome/Objective:**

Outcome 2: Ability to do original research

| Outcome 3: Presentation of Mathematical Research

Measure: Oral exams | **Outcome/Objective:** Outcome 1:
Breadth of Knowledge

Measure: Written Comprehensive examinations |

Outcome/Objective: Outcome 1: Breadth of Knowledge

Implementation Description: Forms and rubrics have been created and adjusted after a trial period, and are being used to assess the outcomes.

Responsible Person/Group: Committee on Assessment, Graduate Coordinator

Evaluation and tracking of goals

The Department has been using the rubrics and forms developed in Fall 2010 to evaluate adherence to the objectives and successful outcomes within the program. The rubrics are periodically reviewed. The outcomes inform the on-going review of requirements for students. The Graduate Coordinator distributes and collects the forms from Graduate Faculty, and collates the results, reporting them to the Assessment Committee.

Established in Cycle: 2011-2012

Implementation Status: In-Progress

Priority: High

Relationships (Measure | Outcome/Objective):

Measure: Dissertation Defense | **Outcome/Objective:**

Outcome 2: Ability to do original research

| Outcome 3: Presentation of Mathematical Research

Measure: Oral exams | **Outcome/Objective:** Outcome 1:
Breadth of Knowledge

Measure: Written Comprehensive examinations |

Outcome/Objective: Outcome 1: Breadth of Knowledge

Implementation Description: Graduate Coordinator distributes the evaluation/assessment forms, collates the results, and reports them to the Department's Assessment Committee

Responsible Person/Group: Graduate Coordinator

Additional Resources: None

SLO 3: Outcome 3: Presentation of Mathematical Research

A candidate will demonstrate the ability to present complex mathematical ideas and arguments, both orally and in writing, in a coherent, comprehensible, and correct manner. In particular, a candidate should be able to compile research results into a format for submission to a professional journal for publication.

Related Measures

M 3: Dissertation Defense

Assessment Method: This outcome will be assessed by all of the above-mentioned committees, and by the dissertation committee when the candidate presents an oral dissertation defense. It will also be assessed by journal editors and referees.

Number of students assessed = 3

Assessment Timeline June 2011 - May 2012

All students will be assessed upon completion of dissertation.
All outcomes will be measured at least once per year.

Source of Evidence: Evaluations

Target:

Definition of Success: At least 75% of the students who present an oral dissertation defense in a calendar year will be given a rating which is at least satisfactory in accordance with the departmental rubric. At least 70% of the graduates in a calendar year will have submitted one or more research papers to a refereed professional journal, with at least 50% of the graduates having such a paper accepted for publication.

Finding (2015-2016) - Target: Met

Four students defended their dissertation during the review period, with all but one examiner rating them as "Highly Satisfactory" or higher (a single student received a single "Satisfactory" rating in their defense). The first part of the target was met and exceeded.

Three of the students defending their dissertation had a research paper submitted and accepted in a refereed journal; the fourth student had submitted a paper upon graduation, though the outcome of the submission is not known to the Graduate Coordinator at this time. The second part of the target was met and exceeded.

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

Closing the loop for outcome 3

Under study

Established in Cycle: 2009-2010

Implementation Status: Planned

Priority: High

Relationships (Measure | Outcome/Objective):

Measure: Dissertation Defense | **Outcome/Objective:**
Outcome 3: Presentation of Mathematical Research

Creation of rubrics and reports

The Department created rubrics for the outcomes that were developed; forms were created to assess whether the goals were met, which are given to involved faculty. These are then collected and collated by the Graduate Coordinator, who follows up in the case of individual students who fail to meet the goal, and of patterns that may indicate weaknesses in the program.

Established in Cycle: 2010-2011

Implementation Status: Finished

Priority: High

Relationships (Measure | Outcome/Objective):

Measure: Dissertation Defense | **Outcome/Objective:**
Outcome 2: Ability to do original research
| Outcome 3: Presentation of Mathematical Research

Measure: Oral exams | **Outcome/Objective:** Outcome 1:
Breadth of Knowledge

Measure: Written Comprehensive examinations |
Outcome/Objective: Outcome 1: Breadth of Knowledge

Implementation Description: Forms and rubrics have been created and adjusted after a trial period, and are being used to assess the outcomes.

Responsible Person/Group: Committee on Assessment, Graduate Coordinator

Evaluation and tracking of goals

The Department has been using the rubrics and forms developed in Fall 2010 to evaluate adherence to the objectives and successful outcomes within the program. The rubrics are periodically reviewed. The outcomes inform the on-going review of requirements for students. The Graduate Coordinator distributes and collects the forms from Graduate Faculty, and collates the results, reporting them to the Assessment Committee.

Established in Cycle: 2011-2012

Implementation Status: In-Progress

Priority: High

Relationships (Measure | Outcome/Objective):

Measure: Dissertation Defense | **Outcome/Objective:**

Outcome 2: Ability to do original research

| Outcome 3: Presentation of Mathematical Research

Measure: Oral exams | **Outcome/Objective:** Outcome 1:

Breadth of Knowledge

Measure: Written Comprehensive examinations |

Outcome/Objective: Outcome 1: Breadth of Knowledge

Implementation Description: Graduate Coordinator distributes the evaluation/assessment forms, collates the results, and reports them to the Department's Assessment Committee

Responsible Person/Group: Graduate Coordinator

Additional Resources: None

Analysis Questions and Analysis Answers

How were assessment results shared and evaluated within the unit?

The results were communicated to the Graduate Faculty during the Departmental meetings in Fall and Spring; the Department Head is kept informed of the results on a more frequent basis.

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?

There was more feedback and education, especially to new faculty, on the expectations and preparations for the oral examination for the PhD. As a result, the students were more successful than in previous cycles, with no student being asked to re-take the exam.

Attempts at organizing "mock oral exams" for students, administered by their more advanced peers, did not really achieve much traction as of yet. It is expected that these will improve outcomes once they become part of the regular preparation from students.

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

Preparation for the oral examination seems to be improving. Whereas in previous cycles there were substandard performances, this review cycle did not see any examiner rate any student less than "Satisfactory", and more than half of the ratings received were "Highly Satisfactory" or better.

Efforts to establish a culture of "mock oral exams" among students were not very vigorous and as a result have not been very successful; this failure has not affected the desired outcomes, but it is hoped that if the efforts succeed, they will improve the outcomes of the students.

Of the Written Comprehensive Examinations, Oral Exam, and Thesis Defense, it is the oral exam that requires the most attention on the part of the unit: the lack of a precise timeline for it means that some students arrived at the exam with less preparation than they should; and the variability in both content and expectations from Faculty also poses challenges. The

education of new faculty on the structure of the exams has helped smooth some of these issues.