

ANNUAL PROGRAM ASSESSMENT REPORT

(For AY 2013-2014 through 2018-2019)

CURRENT YEAR - AY 2016-2017 (Year 4)

UNIT	COLLEGE OF ARTS AND SCIENCES
Department (if applicable)	MATHEMATICS & STATISTICS
Degree/Program	Bachelor of Arts/Pure Math
Prepared By:	
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Annually, complete a separate report for each academic program (major, minor) at each level (undergraduate, graduate) in your department. Reports are to be sent electronically to assessment@washburn.edu by **June 30** each year.

Use size 10 font.

SECTION I

2016-2017 Academic Year
Describe your program's assessment accomplishments since your last report. <i>Cell will expand to accommodate your text.</i>
<p>The Mathematics Department assessed our PSLOs with assignments in several courses. The Department also conducted exit interviews with its graduating students.</p> <p>At a fall department meeting, the Department discussed our assessment plan and results. The 2015-2016 assessment report, collected data from 2015-2016, and subsequent feedback from the Assessment Committee were made available to the faculty. The faculty discussed the report and the Assessment Committee's feedback. The Mathematics Department was generally satisfied with last year's assessment activities. Thus, no changes have been made to our assessment practices or assessment plan.</p> <p>MA 388 Capstone Research is now a credit/no credit course instead of a graded course. Our previous Plan was that 70% of the students in the course would receive a C or better. This has been changed to 70% will receive credit for the course. This change was made because although Mathematics faculty were consistently able to agree on whether a student's capstone project deserved a passing grade, there was often disagreement on the letter grade. The Department looked at other programs and noticed that many of these used a credit/no credit grading system for capstone courses.</p>
Discuss ways in which you have responded to the Assessment Committee comments on last year's report and what assessment work was initiated, continued, or completed. <i>Cell will expand to accommodate your text.</i>
In last year's report, the Department received "Target" ratings in all categories. Due to the high ratings, the Department made no changes to our assessment practices.
Have there been any changes to your Program Assessment Plan (including calendar and curriculum map) since last year's report? <i>Cell will expand to accommodate your text.</i>

<input checked="" type="checkbox"/> Yes (describe what and why below) <input type="checkbox"/> No
Plan adjusted to reflect MA 388 changing to a credit/no credit course.

2015-2016 Academic Year

Describe your program's assessment accomplishments since your last report. <i>Cell will expand to accommodate your text.</i>
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The Mathematics Department assessed our PSLOs with several assignments in a variety of courses. The Department also conducted exit interviews with its graduating students.

At a fall department meeting, the Department discussed our assessment plan and results. The 2014-2015 assessment report, collected data from 2014-2015, and subsequent feedback from the Assessment Committee were made available to the faculty. The faculty discussed the report and the Assessment Committee's feedback. The Mathematics Department was generally satisfied with last year's assessment activities. Thus, little changes have been made to our assessment practices.

In response to last year's feedback from the Assessment Committee, the department has made adjustments to our Assessment Plan.

Discuss ways in which you have responded to the Assessment Committee comments on last year's report and what assessment work was initiated, continued, or completed. <i>Cell will expand to accommodate your text.</i>
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In last year's report, we were at "Target" in all but two categories.

Under "Threshold of Student Success", we received a "Developing" rating. The Committee's report indicated "Identify thresholds for exit survey question-these are mentioned in the report but not listed in the Plan". We have updated our plan to address this.

Under "Stakeholder Involvement", we also received a "Developing" rating. The Committee's comments were "Only faculty involvement stated in Plan. No mention of student engagement in the Plan, or involvement of stakeholders outside the department or in the community." The Department believes it now has a better understanding of what the Assessment Committee is looking for in this category. The Department has regular activities that we believe should have been included in this area. We have updated our Plan to include these activities.

Have there been any changes to your Program Assessment Plan (including calendar and curriculum map) since last year's report? Cell will expand to accommodate your test

<input checked="" type="checkbox"/> Yes (describe what and why below) <input type="checkbox"/> No
Our Plan was updated to reflect the changes as described above. The Plan was also adjusted to reflect a change in course number from MA 153 to MA 253.

2014-2015 Academic Year

Describe your program's assessment accomplishments since your last report. <i>Cell will expand to accommodate your text.</i>
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The Mathematics Department assessed our PSLOs with several assignments in a variety of courses. The Department also conducted exit interviews with its graduating students.

At a fall department meeting, the Department discussed our assessment plan and results. The 2013-2014 assessment report, collected data from 2013-2014, and subsequent feedback from the Assessment Committee were made available to the faculty. The faculty discussed the report and the Assessment Committee's

feedback. The Mathematics Department was generally satisfied with last year's assessment activities. Thus, little changes have been made to our assessment practices.

This fall the faculty began incorporating the PSLOs in their syllabus along with the assessment measures used in the respective class. Faculty were asked to clearly indicate to students which assignments would be used for assessment. At the end of each term, faculty submitted their course assessment reports and subsequent data to the assessment liaison.

The anonymous portion of the exit interview questions were re-worded to reflect the PSLOs. Several faculty participated in the exit interview process.

Discuss ways in which you have responded to the Assessment Committee comments on last year's report and what assessment work was initiated, continued, or completed. *Cell will expand to accommodate your text.*

In last year's report, we were at "Target" in all but two categories.

Under "Threshold of Student Success", the Committee's report indicated "Threshold not stated for Indirect Assessment indicated for each PSLO on Assessment Plan". We have added thresholds under each PSLO for our indirect measure of exit interviews.

Under "Stakeholder Involvement", we received a "Beginning" rating. There were no comments made for this category so we were not exactly sure what we should do to address this. Part of our lower rating may be due to a lack of understanding on what to report for this category. The Mathematics faculty have always monitored recommendations by the American Mathematical Association and the Mathematical Association of America and make curriculum changes when necessary. We are aware of new guidelines to be distributed by the MAA soon and we are already planning to have a faculty member present these guidelines to our Department in the fall. We will adjust our curriculum accordingly if needed. Faculty members also regularly attend and/or present at conferences to stay aware of current national standards and practices. Our Club Mathematica regularly brings in a recent graduates to speak to our students about how their math background has helped them in their current position.

The department did make some changes to address the Stakeholder issue. We reworded some questions on our exit interviews to better reflect our PSLOs. Approximately every five years the Department sends out an alumni survey. The next time this survey is sent, we will attempt to rewrite the questions to also reflect our PSLOs. These changes mean that the stakeholders of our exiting seniors and alumni will now play a larger role in the development and continuous improvement of the Assessment Plan. The Department also began incorporating PSLOs on syllabi.

Have there been any changes to your Program Assessment Plan (including calendar and curriculum map) since last year's report? Cell will expand to accommodate your test

Yes (describe what and why below) No

Questions on the anonymous portion of our exit interviews were reworded to reflect the PSLOs. We have also added thresholds for our exit interviews. Finally, the data collection calendar was adjusted to every other year, since this reflects course rotation for the majority of our upper level courses.

2013-2014 Academic Year

Describe your program's assessment accomplishments since your last report. *Cell will expand to accommodate your text.*

For the 2013-2014 year, the Mathematics department collected data on class grades in the major, assessment assignments in Calculus I, exit interview responses, and final exam data. Results were consistent with departmental expectations.

The Mathematics Department held a meeting in Fall 2013 to discuss and review the departmental assessment plan. Copies of the 2012-2013 assessment report and collected data were made available to all faculty. The Assessment Committee's feedback on our annual assessment report and subsequent ratings were distributed to department faculty and discussed.

In Spring 2014, a Departmental Committee was formed to examine the Program plan and make suggestions for change. These changes are described in the respective field below.

As with the 2012-2013 year, faculty who taught a course in the Program completed the relevant portions of this document on their own. The liaison then merged information from all instructors to create this report.

Discuss ways in which you have responded to the Assessment Committee comments on last year's report and what assessment work was initiated, continued, or completed. *Cell will expand to accommodate your text.*

In last year's report, the Department received rankings of "Advanced" or "Target" in all but one category. The category of "Communication with Students" has been one that the Department has regularly struggled with. The comment for this category on last year's report was: "It is clear that you share accomplishments but not the data driven changes".

We continue to publicize to our current students and alumni our student accomplishments, including our success with presentations/awards at Kappa Mu Epsilon conferences. The Program assessment results have been within our desired range so there have been no "data driven changes" in recent years.

The Department acknowledges that we have not clearly communicated to our students our PSLOs and how we measure them. Starting in Fall 2014, instructors of courses in the Program will be asked to incorporate the respective PSLO(s) that their course addresses on the syllabus. Additionally, instructors will be asked to clearly indicate to students which projects/assignments will be used for assessment reporting and to distribute the departmental grading rubric to students.

Have there been any changes to your Program Assessment Plan (including calendar and curriculum map) since last year's report?

Yes (describe what and why below) No

Since it had been several years since any significant changes were made to the Program Assessment Plan, a departmental committee was formed in Spring 2014 to examine the Program Assessment. The committee suggested several changes, which were voted on and approved by the Department. The previous plan contained six PSLOs which were worded to fit all three tracks for Mathematics majors. The new plan has four PSLOs which target specific outcomes of the Pure Math track. Additionally, faculty members who regularly teach courses for this Program committed to specific assignments/projects which will be used for assessment. Our previous plan used results from the Major Field Test as an assessment measure. The Department was never satisfied with the MFAT as an assessment measure since it tested over courses that we do not offer. Also, in order to get a delineated breakdown of MFAT scores by categories, the department had to hold on to exams until it could submit five at one time. This meant that we frequently were received data on students who had graduated 2-3 years earlier. Because of these issues, the department has decided to no longer include the MFAT as an assessment measure.

SECTION II

Delete rows that are not needed. Copy and paste to add rows. Cells will expand to accommodate your text.

2016-2017 Academic Year			
Program Student Learning Outcomes Analyzed and Reported for Current Year	List the Assessment Measure(s) for each PSLO – if rubrics are used, a copy of each should be in your department's assessment subfolder on the shared drive	Describe the results for PSLOs analyzed (assessed) this year – a copy of summary data should be in your department's assessment subfolder on the shared drive	Describe how results are shared with faculty, students, university-wide entities, and stakeholders (advisory boards, employers, community, alumni, etc.).
PSLO # <u>3</u> Demonstrate the ability to communicate mathematics both orally and in writing.	Direct: 1. 70% of all students completing MA 301, MA 343, MA 354 and MA 371 will obtain a C or better in the course.	1. At least 70% of all students completing courses MA 301 (88%), MA 343 (88%), MA 354 (75%), and MA 371 (88%)	The Department's Office Administrator compiles and distributes a grade distribution document to all math faculty. This document

	<p>70% of all students completing MA 388 will receive credit for the course.</p> <ol style="list-style-type: none"> 2. 70% of all students completing MA 301 will have an average of 2.5 (out of 4) on the course communication assignment(s) using the Departmental rubric. 3. 70% of all students completing MA 343 will have an average of 2.5 (out of 4) on the course communication assignment(s) using the Departmental rubric. 4. 70% of all students completing MA 354 will have an average of 2.5 (out of 4) on the course communication assignment(s) using the Departmental rubric. 5. 70% of all students completing MA 371 will have an average of 2.5 (out of 4) on the course communication assignment(s) using the Departmental rubric. 6. 70% of all students completing MA 388 will receive a 2.5 (out of 4) on their semester-long project, which includes a written report and oral presentation, using the Departmental rubric. 	<p>earned a C or better in the course. For MA 388, 60% of the students received credit for the course.</p> <ol style="list-style-type: none"> 2. Despite repeated requests by the assessment liaison, the MA 301 instructor did not submit assessment information in time to be included in this report. 3. In MA 343, 100% of participating students had an average of > 2.5 on the communication rubric, and the overall class average was 3.47. 4. For MA 354, 6 out of 7 students (85.7%) averaged 2.5 or higher out of 4 on the communication assignments. 5. In MA 371, 100% (9 out of 9) received a 2.50 or higher using a 4 point rubric on communication assessment assignments. The students presented problems from five different board-work assignments. 6. Despite repeated requests by the assessment liaison, the MA 388 instructor did not submit assessment information in time to be included in this report. 	<p>shows the percentage of students who received A, B, C, etc. in Mathematics courses.</p> <p>Results of the course assessment assignments are shared with Department faculty on the S-drive. At the Fall Department meeting, the Assessment Liaison reminds Department faculty to look at the S drive for these results. Faculty are free to ask for more detail from the individual course instructors.</p> <p>The syllabi for the respective courses lists the learning outcomes satisfied by the course, the assessment measures for the course, and aggregate data from recent semesters indicating whether or not the outcome was previously satisfied.</p> <p>The MA 371 communication assignments were board work presented in front of the entire class. While peer students did not grade the assignments, they were given the opportunity to provide feedback and suggestions.</p> <p>Peer students were also present during practice presentations for MA 388 where they had the opportunity to provide feedback. The peer students were also present during the final MA 388 presentations. A group of faculty members were present for and evaluated the final MA 388 presentations. However, the MA 388 instructor did not provide this assessment information in time to be included in this report.</p>
	<p>Indirect:</p> <ol style="list-style-type: none"> 1. No more than 20% of the students responding will mention this as a concern during their free-response exit interview. 2. 70% of the students responding to the anonymous portion of the exit interview will indicate “Good”, “Very Good”, or “Excellent” on questions related to this PSLO. 	<ol style="list-style-type: none"> 1. Five graduating seniors participated in the free-response exit interviews during 2016-2017. The comments on the free-response portion of the exit interviews pertaining to this SLO were positive by 100% of the students. 2. Four students completed the anonymous portion of the exit interviews in 2016-2017. 	<p>All full-time Mathematics faculty are invited to conduct exit interviews. Responses from exit interviews are combined into a single document and posted on the S drive in the Mathematics folder. Faculty are made aware that the document is available for them to view. A copy of the document is sent directly to the Department Chair.</p>

		100% of these students gave a rating of “Good”, “Very Good”, or “Excellent” on questions related to this PSLO.	
<p>PSLO # <u>4</u> Demonstrate the ability to identify and utilize the appropriate practices and tools, including the use of technology, to solve mathematics problems.</p>	<p>Direct:</p> <ol style="list-style-type: none"> 70% of all students completing MA 253, MA 301 and MA 343 will obtain a C or better in the course. 70% of all students completing MA 253 will obtain an average of 2.5 (out of 4) on course project(s) using the Departmental rubric. 70% of all students completing MA 301 will have an average of 2.5 (out of 4) on the course project(s) using the Departmental rubric. 70% of all students completing MA 343 will have an average of 2.5 (out of 4) on the course project(s) using the Departmental rubric. 	<ol style="list-style-type: none"> For the 2016-2017 year, at least 70% of all students completing courses MA 253 (84.4%), MA 301 (88%), and MA 343 (88%) earned a C or better in the course. For MA 253, in Spring 2017, three projects requiring use of the computer algebra system Maple were assessed according to the 4-point departmental rubric, then those scores were averaged. 13 out of 17 students (76.5%) obtained an average of 2.5 or higher, meeting the objective. Despite repeated requests by the assessment liaison, the Fall 2016 MA 253 instructor did not submit assessment information in time to be included in this report. Despite repeated requests by the assessment liaison, the MA 301 instructor did not submit assessment information in time to be included in this report. In spring 2017, 95% of students in MA 343 had an average of > 2.5 on the ability to perform statistical modeling rubric, and the overall class average was 3.28. 	<p>The Department’s Office Administrator compiles and distributes a grade distribution document to all math faculty. This document shows the percentage of students who received A, B, C, etc. in Mathematics courses.</p> <p>Results of the course assessment assignments are shared with Department faculty on the S-drive. At the Fall Department meeting, the Assessment Liaison reminds Department faculty to look at the S drive for these results. Faculty are free to ask for more detail from the individual course instructors.</p> <p>The syllabi for the respective courses lists the learning outcomes satisfied by the course, the assessment measures for the course, and aggregate data from recent semesters indicating whether or not the outcome was previously satisfied.</p> <p>All full-time Mathematics faculty are invited to conduct exit interviews. Responses from exit interviews are combined into a single document and posted on the S drive in the Mathematics folder. Faculty are made aware that the document is available for them to view. A copy of the document is sent directly to the Department Chair.</p>
	<p>Indirect:</p> <ol style="list-style-type: none"> No more than 20% of the students responding will mention this as a concern during their free-response exit interview. 70% of the students responding to the anonymous portion of the exit interview will indicate “Good”, “Very 	<ol style="list-style-type: none"> Five graduating seniors participated in the free-response exit interviews during 2016-2017. The comments on the free-response portion of the exit interviews regarding this PSLO were generally positive by 	

	Good”, or “Excellent” on questions related to this PSLO.	100% of the students with regard to the Pure Math Track. 2. Four students completed the anonymous portion of the exit interviews in 2014-2015. 100% of these students gave a rating of “Good”, “Very Good”, or “Excellent” on questions related to this PSLO.	
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Discuss the implications of the results reported above and how faculty members are involved in using assessment data to improve student learning.

The desired measure for MA 388 Capstone Research is that 70% will receive credit for the course. For 2016-2017, only 60% of the students received credit. The Capstone Research course requires students to complete a research project with a faculty project advisor. Five students were enrolled in Fall 2016 and two of these students did not complete their projects. Initially these students were assigned incompletes in the course and given the opportunity to complete their projects in the Spring 2017 semester. Faculty project advisors tried repeatedly to set up meeting times with these students, but the students did not respond and hence did not complete their projects. At the Fall 2017 Department meeting, the faculty will discuss the situation and see if there was anything more that could have been done. For Fall 2017 the Department has already made a change that could help with this issue. Instead of students taking MA 388 simultaneously with MA 387 Capstone Experience, students will take at least two semester of a one-hour credit MA 380 Problem Solving Strategies. Students will be encouraged to take at least one semester of MA 380 before taking MA 388. It is hoped that this will give students more direction on what they want to do for their Capstone Project and let them start their projects earlier.

Many of our Program courses are taught by the same instructor each time the course is offered. These instructors use results to make any necessary changes to their course(s).

Assessment data for courses that are taught by multiple faculty are shared with the respective faculty. These faculty then discuss results together and decide what, if any changes, should be made.

Faculty who teach a prerequisite course to another Program course share assessment data with the instructor(s) of the subsequent course(s). This gives the faculty of the subsequent course(s) the opportunity to make any necessary adjustments.

Assessment data is posted on the S drive for any interested math faculty member to review.

Other than the aforementioned MA 388 grade distribution, the assessment data is consistent with our desired results so no major changes have been made.

Describe how students and external stakeholders (advisory boards, employers, community, alumni, etc.) are made aware of PSLOs and measures.

The syllabi for the respective courses lists the learning outcomes satisfied by the course, the assessment measures for the course, and aggregate data from previous semesters indicating if the outcome was previously satisfied.

Assessment results are shared with Department faculty on the S-drive. At the Fall Department meeting, the Assessment Liaison reminds Department faculty to look at the S drive for results. Faculty are free to ask for more detail from individual instructors. Responses from exit interviews are combined into a single document and posted on the S drive in the Mathematics folder. Faculty are made aware that the document is available for them to view. A copy of the document is sent directly to the Department Chair.

The department conducts exit interviews for its graduating seniors. These interviews give students the opportunity to voice concerns and/or offer suggestions for changes to the Program. Each student is interviewed separately by two different Mathematics faculty members. Several math faculty participate in the interview

process. The overall results are compiled into a single file and placed on the S drive for all Mathematics faculty to view. In the past, Program changes have been made due to concerns/suggestions given in exit interviews. Recently there have been no suggestions for major changes to the Program.

The exit interview contains an anonymous portion. Questions on the anonymous portion reflect the PSLOs.

The Mathematics Department believes that the American Mathematical Society and the Mathematical Association of America are important stakeholders in our program. We continue to monitor changes and suggestions made by these organizations. If and when these organizations suggest changes, we will adjust our major accordingly. Faculty members regularly attend and present at regional and national conferences. One faculty is a member of the National MAA Assessment Committee and another is on the Executive Committee for the Kansas MAA. In addition, a faculty member recently accepted a position on the MAA National Committee on Undergraduate Programs in Mathematics.

2015-2016 Academic Year

Program Student Learning Outcomes Analyzed and Reported for Current Year	List the Assessment Measure(s) for each PSLO – if rubrics are used, a copy of each should be in your department’s assessment subfolder on the shared drive	Describe the results for PSLOs analyzed (assessed) this year – a copy of summary data should be in your department’s assessment subfolder on the shared drive	Describe how results are shared with faculty, students, university-wide entities, and stakeholders (advisory boards, employers, community, alumni, etc.)
<p>PSLO #1 Demonstrate the ability to solve a variety of problems in mathematics including calculus, probability and statistics, algebra, and linear algebra.</p>	<p>Direct:</p> <p>1) 70% of all students completing MA 151 will obtain an average of 2.5 (out of 4) on specified assessment assignments using the Departmental rubric.</p> <p>2) 70% of all students completing the respective courses will obtain a C or better in the course.</p>	<p>1) In Fall 2015, 84.8% (28 out of 33) of students completing MA 151 average at least 2.5 on the assessment homework problems and assessment final exam problems. In Spring 2016, 24 out of 27 (88.9%) students averaged at least a 2.5 on the assessment assignments. This objective was satisfied.</p> <p>2) In 2015-2016, all but one course had at least 70% of all students completing the course earn a C or better. The one exception was the Fall 2015 MA 152 Calculus II course, which had 9/14 or 64% of the students enrolled at the end of the semester earn a C or higher. However, this course had 3/14 or 21% of the class receive a QF, which could be interpreted as these students did not complete the course. In this case, 9/11 or 82% of the students earned a C or better. If one includes the QF students in the data, for the entire 2015-2016 year, 27 out of 37</p>	<p>Results of the MA 151 assessment assignments are shared with Department faculty on the S-drive. At the Fall Department meeting, the Assessment Liaison reminds Department faculty to look at the S drive for results. Faculty are free to ask for more detail from the individual instructor.</p> <p>The syllabi for the respective courses lists the learning outcomes satisfied by the course, the assessment measures for the course, and aggregate data from previous semesters indicating if the outcome was previously satisfied.</p> <p>The Departmental Secretary compiles and distributes a Grade Distribution document to all math faculty. This document shows the percentage of students who received A, B, C, etc. in Mathematics courses.</p> <p>All tenured/tenure-track faculty are invited to conduct exit interviews. Responses from exit interviews are combined into a single</p>

		or 73% of the students completing MA 152 earned a C or better. Thus, the objective is considered to be satisfied.	document and posted on the S drive in the Mathematics folder. Faculty are made aware that the document is available for them to view. A copy of the document is sent directly to the Department Chair.
	<p>Indirect:</p> <p>1) No more than 20% of the students responding will mention this as a concern during their free-response exit interview.</p> <p>2) 70% of the students responding to the anonymous portion of the exit interview will indicate “Good”, “Very Good”, or “Excellent” on questions related to this PSLO.</p>	<p>1) During the free-response portion of the exit interview, no student mentioned problem solving abilities as a concern.</p> <p>2) For 2015-2016, 5 students completed the anonymous portion of the exit interview. 100% of the students answered “Good”, “Very Good”, or “Excellent” on the question pertaining to PSLO #1.</p>	
<p>PSLO #2 Demonstrate the ability to write mathematical proofs and solve challenging problems both pure and applied.</p>	<p>Direct:</p> <p>1) 70% of all students completing MA 207, MA 354, MA 371, and MA 372 will have an average of 2.5 (out of 4) on select final exam proof problems using the Departmental rubric.</p> <p>2) 70% of all students completing the respective courses will obtain a C or better in the course.</p>	<p>1) This measure was satisfied. Percentages of students earning at least 2.5 out of 4 on select final exam proof problems for the specific classes are as follows:</p> <p>MA 207 (Spring 2016): 13 out of 14 students (92.9%)</p> <p>MA 354 (Fall 2015): 6 out of 7 students (85.7%)</p> <p>MA 371 (Fall 2014): 8 out of 9 students (88.9%)</p> <p>MA 372 (Spring 2015): 4 out of 4 students (100%)</p> <p>2) In 2015-2016, all courses had at least 70% of all students completing the course earn a C or better.</p>	<p>Results of the final exam proof problems are shared with Department faculty on the S-drive. At the Fall Department meeting, the Assessment Liaison reminds Department faculty to look at the S drive for results. Faculty are free to ask for more detail from the individual instructor.</p> <p>The syllabi for the respective courses lists the learning outcomes satisfied by the course, the assessment measures for the course, and aggregate data from previous semesters indicating if the outcome was previously satisfied.</p> <p>The Departmental Secretary compiles and distributes a Grade Distribution document to all math faculty. This document shows the percentage of students who received A, B, C, etc. in Mathematics courses.</p>

	<p>Indirect:</p> <p>1) No more than 20% of the students responding will mention this as a concern during their free-response exit interview.</p> <p>2) 70% of the students responding to the anonymous portion of the exit interview will indicate “Good”, “Very Good”, or “Excellent” on questions related to this PSLO.</p>	<p>1) During the free-response portion of the exit interview, 80% of the students did not mention this as a concern. Only one student (which represents the 20%), indicated that “maybe” they had a gap in their education with “more theoretical stuff”.</p> <p>2) For 2015-2016, 5 students completed the anonymous portion of the exit interview. There are two questions on the anonymous portion which pertain to this PSLO. On one of the questions, 100% of the students answered “Good”, “Very Good”, or “Excellent”. On the other question, 80% of the students answered “Good”, “Very Good”, or “Excellent”. Thus, the objective was satisfied.</p>	<p>All tenured/tenure-track faculty are invited to conduct exit interviews. Responses from exit interviews are combined into a single document and posted on the S drive in the Mathematics folder. Faculty are made aware that the document is available for them to view. A copy of the document is sent directly to the Department Chair.</p>
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Discuss the implications of the results reported above and how faculty members are involved in using assessment data to improve student learning.

Many of our Program courses are taught by the same instructor each time the course is offered. These instructors use results to make any necessary changes to their course(s).

Assessment data for courses that are taught by multiple faculty are shared with the respective faculty. These faculty then discuss results together and decide what, if any changes, should be made.

Faculty who teach a prerequisite course to another Program course share assessment data with the instructor(s) of the subsequent course(s). This gives the faculty of the subsequent course(s) the opportunity to make any necessary adjustments.

Assessment data is posted on the S drive for any interested math faculty member to review.

Our assessment data is consistent with our desired results so no major changes have been made.

Describe how students and external stakeholders (advisory boards, employers, community, alumni, etc.) are made aware of PSLOs and measures.

The syllabi for the respective courses lists the learning outcomes satisfied by the course, the assessment measures for the course, and aggregate data from previous semesters indicating if the outcome was previously satisfied.

Assessment results are shared with Department faculty on the S-drive. At the Fall Department meeting, the Assessment Liaison reminds Department faculty to look at the S drive for results. Faculty are free to ask for more detail from individual instructors. Responses from exit interviews are combined into a single document and posted on the S drive in the Mathematics folder. Faculty are made aware that the document is available for them to view. A copy of the document is sent directly to the Department Chair.

The department conducts exit interviews for its graduating seniors. These interviews give students the opportunity to voice concerns and/or offer suggestions for changes to the Program. Each student is interviewed separately by two different Mathematics faculty members. Several math faculty participate in the interview

process. The overall results are compiled into a single file and placed on the S drive for all Mathematics faculty to view. In the past, Program changes have been made due to concerns/suggestions given in exit interviews. Recently there have been no suggestions for major changes to the Program.

The exit interview contains an anonymous portion. Questions on the anonymous portion reflect the PSLOs.

The Mathematics Department believes that the American Mathematical Society and the Mathematical Association of America are important stakeholders in our program. We continue to monitor changes and suggestions made by these organizations. If and when these organizations suggest changes, we will adjust our major accordingly. Faculty members regularly attend and present at regional and national conferences. One faculty is a member of the National MAA Assessment Committee and another is on the Executive Committee for the Kansas MAA.

2014-2015 Academic Year

Program Student Learning Outcomes Analyzed and Reported for Current Year	List the Assessment Measure(s) for each PSLO – if rubrics are used, a copy of each should be in your department’s assessment subfolder on the shared drive	Describe the results for PSLOs analyzed (assessed) this year – a copy of summary data should be in your department’s assessment subfolder on the shared drive	Describe how results are shared with faculty, students, university-wide entities, and stakeholders (advisory boards, employers, community, alumni, etc.)
<p>PSLO # <u>3</u> Demonstrate the ability to communicate mathematics both orally and in writing.</p>	<p>Direct:</p> <ol style="list-style-type: none"> 7. 70% of all students completing MA 301, MA 343, MA 354, MA 371, and MA 388 will obtain a C or better in the course. 8. 70% of all students completing MA 301 will have an average of 2.5 (out of 4) on the course communication assignment(s) using the Departmental rubric. 9. 70% of all students completing MA 343 will have an average of 2.5 (out of 4) on the course communication assignment(s) using the Departmental rubric. 10. 70% of all students completing MA 354 will have an average of 2.5 (out of 4) on the course communication assignment(s) using the Departmental rubric. 11. 70% of all students completing MA 371 will have an average of 2.5 (out of 4) on the course communication 	<ol style="list-style-type: none"> 7. At least 70% of all students completing courses MA 301, MA 343, MA 354, MA 371 and MA 388 earned a C or better in the course. 8. In Fall 2014, 97.14% of students in MA 301 had an average of 2.5 or higher on a project requiring application of course knowledge to a novel situation and developed a written response in the form of a project report. 9. 87.5% of students in Spring 2015 MA 343 had an average of > 2.5 on the communication project. 10. The MA 354 were assessed on three communication assignments. On the first assessment, 100% of the students earned a score of 3 or more, with an average score of 3.8. On the second assessment, 100% the students earned a score of 3 or 	<p>The Departmental Secretary compiles and distributes a Grade Distribution document to all math faculty. This document shows the percentage of students who received A, B, C, etc. in Mathematics courses.</p> <p>The graded assignments were returned to students in a timely fashion.</p> <p>The summary results will be provided to all faculty who regularly teach upper level mathematics courses. The full results will be shared with all interested faculty, who will be identified through an e-mail request.</p> <p>The MA 371 communication assignments were board work presented in front of the entire class. While peer students did not grade the assignments, they were given the opportunity to provide feedback and suggestions.</p> <p>Peer students were also present during practice presentations for MA 388 where they had the opportunity to provide feedback. The peer</p>

	<p>assignment(s) using the Departmental rubric.</p> <p>12. 70% of all students completing MA 388 will receive a 2.5 (out of 4) on their semester-long project, which includes a written report and oral presentation, using the Departmental rubric.</p>	<p>more, with an average score of 4.0. On the third assessment, 100% of the students earned a score of 3 or more, with an average of 3.53.</p> <p>11. MA 371 had five communication assignments. 100% of the students earned an average of 2.5 or greater on these assignments. The class averages on the assignments were 3.33, 3.56, 3.78, 4.0, and 4.0.</p> <p>12. Presentations are given by each student in MA 388. These were evaluated by a group of faculty members (all of which were present during the presentations) and the evaluations were collected and averaged. All students obtained an average above 2.5/4.</p>	<p>students were also present during the final MA 388 presentations. A group of faculty members were present for and evaluated the final MA 388 presentations.</p> <p>All tenured/tenure-track faculty are invited to conduct exit interviews. Responses from exit interviews are combined into a single document and posted on the S drive in the Mathematics folder. Faculty are made aware that the document is available for them to view. A copy of the document is sent directly to the Department Chair.</p>
	<p>Indirect:</p> <p>3. No more than 20% of the students responding will mention this as a concern during their free-response exit interview.</p> <p>4. 70% of the students responding to the anonymous portion of the exit interview will indicate “Good”, “Very Good”, or “Excellent” on questions related to this PSLO.</p>	<p>1. Seven graduating seniors participated in the free-response exit interviews during 2014-2015. The comments on the free-response portion of the exit interviews were overwhelming positive by 100% of the students.</p> <p>2. Four students completed the anonymous portion of the exit interviews in 2014-2015. 100% of these students gave a rating of “Good”, “Very Good”, or “Excellent” on questions related to this PSLO.</p>	
<p>PSLO # <u>4</u> Demonstrate the ability to identify and utilize the appropriate practices and tools, including the use of technology, to solve mathematics problems.</p>	<p>Direct:</p> <p>5. 70% of all students completing MA 153, MA 301 and MA 343 will obtain a C or better in the course.</p> <p>6. 70% of all students completing MA 153 will obtain an average of 2.5 (out</p>	<p>5. At least 70% of all students completing courses MA 153, MA 301 and MA 343 earned a C or better in the course.</p> <p>6. In Fall 2014, three projects requiring use of the computer algebra system Maple were</p>	<p>The Departmental Secretary compiles and distributes a Grade Distribution document to all math faculty. This document shows the percentage of students who received A, B, C, etc. in Mathematics courses.</p>

	<p>of 4) on course project(s) using the Departmental rubric.</p> <p>7. 70% of all students completing MA 301 will have an average of 2.5 (out of 4) on the course project(s) using the Departmental rubric.</p> <p>8. 70% of all students completing MA 343 will have an average of 2.5 (out of 4) on the course project(s) using the Departmental rubric.</p>	<p>assessed in MA 153. The projects were graded according to the 4-point departmental rubric, then those scores were averaged. 10 out of 12 students (83.3%) obtained an average of 2.5 or higher, meeting the objective. In Spring 2015, 9 of the 11 students enrolled in MA 153 (81.8%) averaged 2.5 or higher on the course projects according to the department's rubric.</p> <p>7. In Fall 2014, 97.14% of students in MA 301 had an average of 2.5 or higher on a project requiring the use of technology.</p> <p>8. 81.3% of students in MA 343 had an average of > 2.5 on challenging applied problems rubric, and the overall class average was 3.03.</p>	<p>The graded assignments were returned to students in a timely fashion.</p> <p>The summary results will be provided to all faculty who regularly teach upper level mathematics courses. The full results will be shared with all interested faculty, who will be identified through an e-mail request.</p> <p>All tenured/tenure-track faculty are invited to conduct exit interviews. Responses from exit interviews are combined into a single document and posted on the S drive in the Mathematics folder. Faculty are made aware that the document is available for them to view. A copy of the document is sent directly to the Department Chair.</p>
	<p>Indirect:</p> <p>1. No more than 20% of the students responding will mention this as a concern during their free-response exit interview.</p> <p>2. 70% of the students responding to the anonymous portion of the exit interview will indicate "Good", "Very Good", or "Excellent" on questions related to this PSLO.</p>	<p>1. Seven graduating seniors participated in the free-response exit interviews during 2014-2015. The comments on the free-response portion of the exit interviews were overwhelming positive by 100% of the students.</p> <p>2. Four students completed the anonymous portion of the exit interviews in 2014-2015. 100% of these students gave a rating of "Good", "Very Good", or "Excellent" on questions related to this PSLO.</p>	
<p>Discuss the implications of the results reported above and how faculty members are involved in using assessment data to improve student learning.</p>			
<p>Many of our Program courses are taught by the same instructor each time the course is offered. These instructors use results to make any necessary changes to their course(s).</p>			

Assessment data for courses that are taught by multiple faculty are shared with the respective faculty. These faculty then discuss results together and decide what, if any changes, should be made.

Faculty who teach a prerequisite course to another Program course share assessment data with the instructor(s) of the subsequent course(s). This gives the faculty of the subsequent course(s) the opportunity to make any necessary adjustments.

Assessment data is posted on the S drive for any interested math faculty member to review.

Our assessment data is consistent with our desired results so no major changes have been made.

Describe how students and external stakeholders (advisory boards, employers, community, alumni, etc.) are made aware of PSLOs and measures.

Course syllabi list the PSLOs and the measures used to assess them. Faculty also are asked to indicate to students which specific assignments are addressing PSLOs.

The department conducts exit interviews for its graduating seniors. These interviews give students the opportunity to voice concerns and/or offer suggestions for changes to the Program. Each student is interviewed separately by two different Mathematics faculty members. Several math faculty participate in the interview process. The overall results are compiled into a single file and placed on the S drive for all Mathematics faculty to view. In the past, Program changes have been made due to concerns/suggestions given in exit interviews. Recently there have been no suggestions for major changes to the Program.

The exit interview contains an anonymous portion. Questions on the anonymous portion reflect the PSLOs.

Every five years the Department conducts an alumni survey. The alumni survey results are included as part of our Program Review.

The Mathematics Department believes that the American Mathematical Society and the Mathematical Association of America are important stakeholders in our program. We continue to monitor changes and suggestions made by these organizations. If and when these organizations suggest changes, we will adjust our major accordingly. Faculty members regularly attend and present at regional and national conferences. One faculty is a member of the National MAA Assessment Committee and another is on the Executive Committee for the Kansas MAA.

This year our Club Mathematica had a panel discussion of Mathematics graduate students from Kansas State University. One of the panel members was a graduate of Washburn. The panel answered questions from students/faculty about expectations in graduate school. Our alumni member was asked several questions regarding whether her background at Washburn had prepared her for graduate school and she indicated that it had.

2013-2014 Academic Year

Program Student Learning Outcomes Analyzed and Reported for Current Year	List the Assessment Measure(s) for each PSLO – if rubrics are used, a copy of each should be in your department’s assessment subfolder on the shared drive	Describe the results for PSLOs analyzed (assessed) this year – a copy of summary data should be in your department’s assessment subfolder on the shared drive	Describe how results are shared with faculty, students, university-wide entities, and stakeholders (advisory boards, employers, community, alumni, etc.)
PSLO # <u>1</u> Demonstrate the ability to solve a variety of problems in mathematics including calculus,	Direct: 70% of all students completing MA151, MA152, MA153, MA207, MA301, MA343 will obtain a C or better in the course.	In 2013-2014, at least 70% of students completing MA151, MA152, MA153, MA207, MA301, MA343 received a C or better in the course.	The Departmental Secretary compiles and distributes a Grade Distribution document to all math faculty. This document shows the percentage of students who received A, B, C, etc. in Mathematics courses.

<p>probability and statistics, and linear algebra.</p>	<p>70% of all students completing MA151 will obtain an average of 2.5 (out of 4) on specified assessment assignments using the Departmental rubric.</p>	<p>All Fall and Spring sections of MA151 Calculus I gave four assessment assignments to their classes. These assignments covered the topics of limits, derivatives, applications of derivatives, and integrations. The assignments were graded with the departmental rubric. In both Fall 2013 and Spring 2014, the percentage of students earning at least a 2.5 (out of 4) was over 70% for each of the four assignments.</p>	<p>The graded assessment assignments in MA151 were returned to students with comments indicating the reasons for the particular scores. These assignments were returned to students before the corresponding exams.</p> <p>The instructors of MA151 from Fall/Spring discussed the content of the assessment assignments with the Department Chair. The instructors of MA151 also discussed the student performance on these assignments. The student performance results were given to the instructors of MA152 for the subsequent semesters. Results are also posted in a Departmental folder on the S drive.</p>
	<p>Indirect: Exit Interviews</p>	<p>All graduating students were asked to participate in face-to-face exit interviews with departmental faculty. Those who chose to participate were also given exit questions which were returned anonymously. Of our 10 graduating Seniors, 9 participated in the face-to-face exit interviews and 6 of those returned the anonymous portion.</p>	<p>All tenured/tenure-track faculty are invited to conduct exit interviews. Responses from exit interviews are combined into a single document and posted on the S drive in the Mathematics folder.</p>
<p>PSLO # <u>2</u> Demonstrate the ability to write mathematical proofs and solve challenging problems both pure and applied.</p>	<p>Direct: 70% of all students completing MA207, MA344, MA354, MA371, MA372, MA387 will obtain a C or better in the course.</p> <p>70% of all students completing MA207, MA354, MA371, and MA372 will have an average of 2.5 (out of 4) on select final exam proof problems using the Departmental rubric.</p>	<p>In 2013-2014, at least 70% of students completing MA207, MA 344, and MA 354 received a C or better in the course. MA371 and MA372 were not offered. In MA387, 3 of 5 (60%) students enrolled in the course completed the course with a C or better. One other student received an incomplete. This student has now completed the course with an A, so 4 of the 5 (80%) students eventually earned a C or better.</p> <p>In Fall 2013, 80% of students in MA354 earned an average score of 2.5 or higher on the selected final exam proof problems. The class</p>	<p>The Departmental Secretary compiles and distributes a Grade Distribution document to all math faculty. This document shows the percentage of students who received A, B, C, etc. in each Mathematics course.</p> <p>The results from the MA207 final exam will be shared and discussed with faculty who regularly teach this course. Results will be posted on the S drive for any interested math faculty to review. Results will also be shared with faculty who teach courses that have MA207 as a prerequisite.</p> <p>Results from the MA354 final exam will be shared with faculty who regularly teach proof courses. These faculty will be encouraged to make suggestions on how to improve the</p>

		<p>average on these problems was 3.65.</p> <p>In Fall 2013, 6 of the 10 students (60%) who took the final exam in MA207 earned an average score of 2.5 or higher on the selected final exam proof problems. With a class size of only 10, if one more student had earned an average of 2.5 or higher, the desired 70% what have been met. Of the students who did not earn a 2.5 or higher, two students had an average between 2.25 and 2.45. The class average for the Fall 2013 semester was 2.89.</p> <p>MA207 was offered as an independent study in Spring 2014. The one student in this course had an average of 3.23 on selected exam proof problems. Considering that this student was one of the four from the Fall 2013 class who did not earn a 2.5 average, the 10 students who took the MA207 final exam in 2013-2014, seven (70%) eventually earned an average of 2.5 or higher on the selected exam proof problems.</p> <p>MA371 and MA372 were not offered in 2013-2014.</p>	<p>wording and/or problem selection. Results will be posted on the S drive and faculty input on suggestions for change will be considered for future final exam problems.</p>
	<p>Indirect: Exit Interviews</p>	<p>See comments regarding exit interviews on PSLO #1</p>	

Describe how faculty members were involved in using assessment data to improve student learning.

Many of our Program courses are taught by the same instructor each time the course is offered. These instructors use results to make any necessary changes to their course(s).

Assessment data for courses that are taught by multiple faculty are shared with the respective faculty. These faculty then discuss results together and decide what, if any changes, should be made.

Faculty who teach a prerequisite course to another Program course share assessment data with the instructor(s) of the subsequent course(s). This gives the faculty of the subsequent course(s) the opportunity to make any necessary adjustments.

Assessment data is posted on the S drive for any interested math faculty member to review.

Our assessment data is consistent with our desired results so no major changes have been made.

Describe how stakeholders are engaged in your assessment plan and process.

The department conducts exit interviews for its graduating seniors. These interviews give students the opportunity to voice concerns and/or offer suggestions for changes to the Program. Each student is interviewed separately by two different Mathematics faculty members. Several math faculty participate in the interview process. The overall results are compiled into a single file and placed on the S drive for all Mathematics faculty to view. In the past, Program changes have been made due to concerns/suggestions given in exit interviews. Recently there have been no suggestions for major changes to the Program.

The exit interview contains an anonymous portion. Questions on the anonymous portion mimic those that are sent to our alumni every five years. The alumni results are included as part of our Program Review. The department plans to compare results from our recent graduates to those of our alumni the next time the alumni survey is completed.

SECTION III

2016-2017 Academic Year

During this year, if any PSLO was addressed through new or unique experiences outside the classroom, explain where and how the opportunities were provided to students in your program (i.e. internships, field experiences, visiting lectures, collaborative projects, and other creative ideas you have employed).

N/A

2015-2016 Academic Year

During this year, if any PSLO was addressed through new or unique experiences outside the classroom, explain where and how the opportunities were provided to students in your program (i.e. internships, field experiences, visiting lectures, collaborative projects, and other creative ideas you have employed).

N/A

2014-2015 Academic Year

During this year, if any PSLO was addressed through new or unique experiences outside the classroom, explain where and how the opportunities were provided to students in your program (i.e. internships, field experiences, visiting lectures, collaborative projects, and other creative ideas you have employed).

N/A

2013-2014 Academic Year

During this year, if any PSLO was addressed through new or unique experiences outside the classroom, explain where and how the opportunities were provided to students in your program (i.e. internships, field experiences, visiting lectures, collaborative projects, and other creative ideas you have employed).

N/A

SECTION IV

2016-2017 Academic Year

In light of what you have learned through your assessment efforts this year, what are your plans for the next academic year?

One instructor did not provide assessment information in time to be included in this report. During the fall Department meeting, the assessment liaison will emphasize the importance of reporting information in a timely manner (original request was for assessment information to be received by May 30). Next year the liaison will inform the Chair immediately if instructors do not submit their assessment information by the requested date.

The Department has reviewed new curriculum guidelines from the MAA. Although our current program and curriculum is in line with the MAA guidelines, the process of reviewing our program has led to a Program Change to take effect in 2017-2018. MA 387 Capstone Experience (2 cr) will be replaced with MA 380 Problem Solving Strategies. MA 380 is a one hour course that can be taken up to 3 times, with a different set of problems for each term. Students in the major will be required to take MA 380 at least twice. This program change will allow students to take at least one semester of MA 380 prior to taking MA 388 Capstone Research. Previously students took MA 387 simultaneously with MA 388. The Department believes this change will encourage students to think about their capstone projects earlier and choose a topic prior to enrolling in MA 388.

2015-2016 Academic Year

In light of what you have learned through your assessment efforts this year and in past years, what are your plans for the next academic year?

The Department is currently in the process of reviewing recently received curriculum guidelines from the MAA. Since many of the courses for this track are also in the Secondary Education Track, The Department is also reviewing recent KBOR guidelines for Secondary Education majors. The Department will make curriculum and assessment changes as needed to fit these guidelines.

2014-2015 Academic Year

In light of what you have learned through your assessment efforts this year and in past years, what are your plans for the next academic year?

We are aware of new guidelines from the MAA that will be available soon. We have already designated a Department member to research these guidelines when available and present them to the Department. The Department will make curriculum changes as needed to fit these guidelines.

2013-2014 Academic Year

In light of what you have learned through your assessment efforts this year and in past years, what are your plans for the next academic year?

Since data is consistent with our desired results, no major changes are anticipated for the Program.

Supporting documents (rubrics, summary data tables/charts, etc.) should be in your department's assessment subfolder on the shared drive in the correct academic year subfolder.