

Weber State University
Annual Assessment of Evidence of Learning

Cover Page

Department/Program: Mathematics
Academic Year of Report: 2014/15
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A. Brief Introductory Statement:

Please review the Introductory Statement and contact information for your department displayed on the assessment site: <http://www.weber.edu/portfolio/departments.html> - if this information is current, please place an 'X' below. No further information is needed. We will indicate "Last Reviewed: [current date]" on the page.

Information is current; no changes required.

Information is not current; updates below.

Update:

B. Mission Statement

Please review the Mission Statement for your department displayed on the assessment site:

<http://www.weber.edu/portfolio/departments.html> - if it is current, please indicate as much; we will mark the web page as “Last Reviewed [current date]”. No further information is needed.

If the information is not current, please provide an update:

Information is current; no changes required.

Information is not current; updates below.

DEPARTMENT ROLE

The mathematics department provides students with the tools necessary to competently integrate mathematics into their personal and professional lives. We strive to create an environment that makes that possible. Quality teaching of relevant courses and student projects including undergraduate research is our central objective.

Students taking mathematics have various goals that include intellectual enrichment, employment in industry, teaching, and graduate work. We strive to offer a curriculum that meets or exceeds their needs in each area, both in terms of content and of teaching styles. Since mathematics is central to many fields, we design our course offerings in a manner sensitive to the needs of other disciplines.

Because mathematics is a rapidly developing field and the best teachers are those who remain active in their discipline, we engage in such activities as mathematical and educational research, in service teacher training, and course and curriculum development. Professional and scholarly work is both expected and encouraged.

C. Student Learning Outcomes

Please review the Student Learning Outcomes for your department displayed on the assessment site:

<http://www.weber.edu/portfolio/departments.html> - if they are current, please indicate as much; we will mark the web page as “Last Reviewed [current date]”. No further information is needed.

If they are not current, please provide an update:

Information is current; no changes required.

Information is not current; updates below.

Measurable Learning Outcomes

At the end of their study at WSU, students in this program will:

- 1) ...
- 2) ...
- 3) ...
- 4) ...
- 5) ...
- 6) etc.

D. Curriculum

Please review the Curriculum Grid for your department displayed on the assessment site:

<http://www.weber.edu/portfolio/departments.html> - if it is current, please indicate as much; we will mark the web page as “Last Reviewed: [current data]”. No further information is needed.

If the curriculum grid is not current, please provide an update:

Information is current; no changes required.

Information is not current; updates below

Curriculum Map

	Department/Program Learning Outcomes							
	Learning Outcome 1	Learning Outcome 2	Learning Outcome 3	Learning Outcome 4	Etc...			
Core Courses in Department/Program								

Note^a: Define words, letters or symbols used and their interpretation; i.e. 1= introduced, 2 = emphasized, 3 = mastered or I = Introduced, E = Emphasized, U = Utilized, A = Assessed Comprehensively; these are examples, departmental choice of letters/numbers may differ

Note^b: Rows and columns should be transposed as required to meet the needs of each individual department

Additional Information (if needed)

E. Assessment Plan

Please review the Assessment Plan for your department displayed on the assessment site:

<http://www.weber.edu/portfolio/departments.html> - if the plan current, please indicate as much; we will mark the web page as “Last Reviewed [current date]”. No further information is needed.

The site should contain an up-to-date assessment plan with planning going out a minimum of three years beyond the current year. Please review the plan displayed for your department at the above site. The plan should include a list of courses from which data will be gathered and the schedule, as well as an overview of the assessment strategy the department is using (for example, portfolios, or a combination of Chi assessment data and student survey information, or industry certification exams, etc.).

Please be sure to include your planned assessment of any general education courses taught within your department. This information will be used to update the General Education Improvement and Assessment Committee’s planning documentation.

Assessment plan update:

Assessment is an ongoing process in the Mathematics Department. Externally, broad reviews are conducted regularly by the Board of Regents and by Northwest, ABET, and NCATE accrediting agencies. These generally include reviews of departmental offerings, course content, textbooks, and examinations. In these reviews experienced professionals usually compare our program with others and provide the department with reports detailing its perceived strengths and weaknesses. Other programs also undergo similar external reviews. Based on all these reviews and in consultation with client departments, the Mathematics Department makes necessary changes for improvement of its program.

Internally, the Mathematics Department reviews its entire curriculum periodically, has dialogs with client departments, re-evaluates textbooks annually, keeps current on national curriculum trends, and studies course grade distributions from time to time. In addition, faculty share and review examinations, regularly collect student evaluations of teaching, and undergo annual reviews for merit. Faculty also consult with local school districts, graduate schools, and employers.

Data Collection In data collection a balance must be reached between the cost (time, money, etc.) and usefulness of the data while not imposing unreasonable demands on faculty, university resources, students and graduates. There is no single nationally accepted method, such as standardized testing, for overall assessment. While the core topics of most courses are the same nationally, there is no consensus with regard to the importance or depth of coverage of each topic. Any national comparison would be further complicated by differing entrance standards and missions of universities.

Many evaluation criteria cannot be quantified with a simple numerical scale. For example, there is no national ranking for textbooks. Thus, while the Mathematics Department does review textbooks annually, and uses those reviews to select high quality textbooks, little would be gained from further analysis. This is also true for many other collection/evaluation methods listed below.

The following are feasible means of data collection which can lead to a meaningful assessment. Much of these data could be collected through one instrument, such as a survey, while others have been studied for many years.

- College Graduation Exit Survey
- Post-graduate Survey

- Input from Client Departments
- Feedback from General Education Assessment
- Textbook Evaluation
- Exam Evaluation
- Distribution of Grades in Mathematics Courses
- Distribution of Grades in Client Courses
- Student Research and Contests Results
- Graduate School Acceptance
- Graduate Degrees Earned
- Classroom Observations of Student Teachers
- Profile of Entering Students
- Course evidence of learning grids for courses within the majors
- Course evidence of learning grids for the general education QL courses
- Course evidence of learning grids for courses for elementary major courses

To draw accurate conclusions it will be necessary that the data sets be sufficiently large, be from target populations, and be reliable. In order to generate larger data sets, in some instances groups like majors, minors, and client students, will be lumped together, while in others, such as graduate acceptance rate, the data will be accumulated over several years. For accurate targeting it will be necessary to subdivide some groups, like minors, teaching minors and elementary mathematics endorsements. Finally, the surveys and their results should also be analyzed for unintended biases and reliability of data.

The Mathematics Department is doing the following:

- Maintaining an address file of graduates.
- Administering, over time, exit interviews and a questionnaire that inquires about results of standardized tests, acceptance to graduate school, curriculum strengths and weaknesses, obtaining employment, quality of job training, obtaining advanced degrees, teaching effectiveness, etc.
- Performing surveys of majors that make inquiries about courses and reasons they choose or changed major.
- Study the results of general education assessment and then respond in appropriate ways.
- Establish and maintain measurable program learning outcomes and measurable course learning outcomes.
- Target questions on tests and finals that assess whether students are meeting the course learning outcomes and collect the data for the evidence of learning spreadsheets.
- In courses where appropriate, assess student papers and/or projects and collect data on these and report on the completion rates.

Assessment Grid The following grid states how and at what level of effectiveness (High, Medium, or Low) the data collected can be used in assessment of the department's program goals:

1. Mathematics majors should gain a substantive knowledge and comprehension of the major ideas in the core areas of their fields of study (pure mathematics, applied mathematics, mathematics teaching).
2. All mathematics majors should learn a fundamental set of skills that will enable them to succeed in an ever changing world, including problem solving and independent learning, technology and communication.

3. Students pursuing Mathematics Minors, Mathematics Teaching Minors, or Elementary Mathematics Endorsements should be able to effectively apply appropriate mathematical ideas and/or teaching approaches in their field.
4. Mathematics service courses should meet the overall varied needs of client departments. Students in these courses should obtain the required mathematical knowledge.

DATA COLLECTION METHODS	STUDENT LEARNING OUTCOMES							
	MATHEMATICS KNOWLEDGE			FUNDAMENTAL SKILLS			M, TM, ME*	SERVICE
	Pure	Applied	Teaching	PS&IL**	Tech.	Comm.		
College Graduation Exit Survey	M	M	M	L	M	L	L	
Post-graduate Survey	H	H	H	H	H	H	H	
Input from Client Departments							H	H
Feedback from General Education Assessment								H
Textbook Evaluation	M	M	M	M	L	L	M	M
Exam Evaluation	H	H	H	M	L	M	H	H
Distribution of Grades in Mathematics Courses	H	H	H	M	L	M	H	H
Distribution of Grades in Client Courses	L	M	L	M	M	M	M	H
Student Research and Contests Results	M	M	M	H	H	H	L	
Graduate School Acceptance Rate	H	H	H			L	M	
Graduate Degrees Earned	H	H	H	H		M	M	
Classroom Observations of Student Teachers			H	M	M	H	M	
Course evidence of learning grids, majors	H	H	H	H	L	M	H	
Course evidence of learning grids, QL courses				H	H	L	M	H
Course evidence of learning grids, elementary education courses				H	L	H		

*M: Mathematics Minor, TM: Mathematics Teaching Minor, ME: Elementary Mathematics Endorsements

**PS&IL: Problem Solving and Independent Learning

Measurable Course Learning Outcomes and Action Plan for Program Courses beyond QL courses Course learning outcomes for each of the required courses for math majors and elementary majors are listed Appendix H. The curriculum impact grids in C. 5. show the extent to which these learning outcomes impact the program learning outcomes for the math majors. The outcomes are available electronically to department members on the department's network drive. Each time a course above 1080 is taught the instructor will target each of the course learning outcomes with test questions or papers or projects and report the on the student completion rates. See the section on QL below for the assessment plan for the QL course Math 1030, 1040, 1050, 1080. Thresholds will be established according to Bloom's Taxonomy and method of measurement in the range of 65% to 70%. For example a question on a midterm exam is more immediate and will have a rate of 70% while a question on a comprehensive final could have a rate of 65%. Projects or papers will have a rate 70 %. If the completion rates do not meet the thresholds then there will be discussions with the appropriate committee and department to determine the reason and formulate a course of action such as new texts, new approaches, additional homework, etc.

Evidence of learning Spreadsheets

Evidence of learning spreadsheets will be used to assess the learning in each course. Instructors of required courses for majors and elementary education math courses will submit the spreadsheets at the time grades are due (Starting Spring of 2013). Exact details vary by course. The spreadsheets are available electronically to department members. Two samples follow:

A. Evidence of Learning: MATH 1210 Calculus I				
Measurable Learning Outcome	Method of Measurement	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
Students will...	Direct and Indirect Measures*			
1.A: Use algebraic techniques to evaluate limits.	Measure 1: Question on an exam	Measure 1: TBD	Measure 1: TBD	Measure 1: TBD
	Measure 2: Course pass rate	Measure 2: TBD	Measure 2: TBD	Measure 2: TBD
2.A: Find derivative of algebraic and trigonometric functions, defined explicitly or implicitly, using differentiation rules: power, product, quotient, and chain rules and implicit differentiation.	Measure 1: Question on an exam	Measure 1: TBD	Measure 1: TBD	Measure 1: TBD
	Measure 2: Course pass rate	Measure 2: TBD	Measure 2: TBD	Measure 2: TBD
3.A: Interpret derivative as the rate of change and use it to find	Measure 1: Question on an exam	Measure 1: TBD	Measure 1: TBD	Measure 1: TBD

A. Evidence of Learning: MATH 1210 Calculus I				
Measurable Learning Outcome Students will...	Method of Measurement Direct and Indirect Measures*	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
equation of a tangent line, find velocity and acceleration, approximate value of a function, approximate a zero of a function or solve related rate problems.	Measure 2: Course pass rate	Measure 2: TBD	Measure 2: TBD	Measure 2: TBD
4.A: Understand the role of first and second derivatives in the shape of graphs.	Measure 1: Question on an exam	Measure 1: TBD	Measure 1: TBD	Measure 1: TBD
	Measure 2: Course pass rate	Measure 2: TBD	Measure 2: TBD	Measure 2: TBD
5.A: Solve optimization application problems.	Measure 1: Question on an exam	Measure 1: TBD	Measure 1: TBD	Measure 1: TBD
	Measure 2: Course pass rate	Measure 2: TBD	Measure 2: TBD	Measure 2: TBD
6.A: Evaluate definite and indefinite integrals using basic integration techniques, including substitution.	Measure 1: Question on an exam	Measure 1: TBD	Measure 1: TBD	Measure 1: TBD
	Measure 2: Course pass rate	Measure 2: TBD	Measure 2: TBD	Measure 2: TBD
7.A: Interpret the definite integral as a sum and use it to find areas, volumes or the work done by a variable force.	Measure 1: Question on an exam	Measure 1: TBD	Measure 1: TBD	Measure 1: TBD
	Measure 2: Course pass rate	Measure 2: TBD	Measure 2: TBD	Measure 2: TBD
8.A: Be able to use definitions to prove value of a limit, find derivative of a function or evaluate a definite integral, for simple functions.	Measure 1: Question on an exam	Measure 1: TBD	Measure 1: TBD	Measure 1: TBD
	Measure 2: Course pass rate	Measure 2: TBD	Measure 2: TBD	Measure 2: TBD
9.A: Understand important theorems such as Intermediate Value Theorem, Extreme value Theorem, Rolle's Theorem, Differential or Integral Mean Value Theorems or Fundamental Theorem of Calculus.	Measure 1: Question on an exam	Measure 1: TBD	Measure 1: TBD	Measure 1: TBD
	Measure 2: Course pass rate	Measure 2: TBD	Measure 2: TBD	Measure 2: TBD

*At least one measure per objective must be a direct measure; indirect measures may be used to supplement direct measure(s).

B. Evidence of Learning: MATH 2120 Euclidean Geometry				
Measurable Learning Outcome	Method of Measurement	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
Students will...	Direct and Indirect Measures*			
1.A: Know when it is necessary to write a proof and develop the ability to write proofs in the setting of Euclidean geometry.	Measure 1: Question on an exam	Measure 1: TBD	Measure 1: TBD	Measure 1: TBD
	Measure 2: Course pass rate	Measure 2: TBD	Measure 2: TBD	Measure 2: TBD
2.A: Know and understand definitions and basic theorems regarding Euclidean notions of angles, congruence, parallel lines, similarity, and circles.	Measure 1: Question on an exam	Measure 1: TBD	Measure 1: TBD	Measure 1: TBD
	Measure 2: Course pass rate	Measure 2: TBD	Measure 2: TBD	Measure 2: TBD
3.A: Solve problems and prove theorems relating to Euclidean notions of angles, congruence, parallel lines, similarity, and circles.	Measure 1: Question on an exam	Measure 1: TBD	Measure 1: TBD	Measure 1: TBD
	Measure 2: Course pass rate	Measure 2: TBD	Measure 2: TBD	Measure 2: TBD

*At least one measure per objective must be a direct measure; indirect measures may be used to supplement direct measure(s).

High Impact or Service Learning: There is one capstone course for the Math Teaching Major. It will be assessed as the other courses for the major. Math majors get some of this type of experience in several courses. In a few of the upper level courses students are required to solve problems and write papers individually or in groups and sometimes give presentations on the results. For example, in the Mathematical Modeling Course students create original models/solutions to applied problems and sometimes work on these in groups. In other courses students do group work or write papers. In several of the Math Education courses students create lesson plans and give presentations. During their final semester, Mathematics Teaching Majors student teach in local public schools and are observed and critiqued by Math Faculty. The Math Factor, the student math club also sponsors student presentations. The Department has had an annual afternoon seminar on undergraduate research topics in math. As a result we have lately had more students enrolled in our senior project courses. These activities are assessed as in the other courses for majors, via the evidence of learning outcomes where papers, projects, or presentations is identified as one of the course learning outcomes.

General Education QL Assessment Plan

Beginning in Spring of 2012, the Department QL Committee authored 5 Final Exam Questions for each of the QL courses, Math 1030, 1040, 1050, and 1080. The questions will test the 5 QL learning outcomes in each course. All instructors were to add the questions to their final exams and report the completion rate for each of the questions. The completion rate for each question across all sections and total pass rates for all sections were compiled. The results are reported in the evidence of learning outcomes spreadsheets. If the thresholds are not reached then discussions will take place between the instructor and the Quantitative Literacy Committee to determine the reason. This will be done each semester (Fall and Spring) until the thresholds are reached. After that the procedure will be suspended until needed for QL renewal.

F. Report of assessment results for the most previous academic year:

There are a variety of ways in which departments can choose to show evidence of learning. This is one example. The critical pieces to include are 1) what learning outcome is being assessed, 2) what method of measurement was used, 3) what the threshold for 'acceptable performance' is for that measurement, 4) what the actual results of the assessment were, 5) how those findings are interpreted, and 6) what is the course of action to be taken based upon the interpretation.

Evidence of Learning: Courses within the Major

Evidence of Learning: MATH 4210/4220 Introductory Real Analysis				
Measurable Learning Outcome	Method of Measurement	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
Students will...	Direct and Indirect Measures*			
1.A: Effectively write mathematical solutions and proofs in a clear and concise manner.	Measure 1: Question on an exam	Math 4210 83%	Students successfully met this objective over the 70% threshold.	None
	Measure 2: Course pass rate	Math 4210 91% passed	Students successfully met this objective over the 70% threshold.	None
2.A: Know, understand, and be able to apply basic results from set theory and point-set topology to establish theorems and prove conjectures in a clear and mathematically correct way.	Measure 1: Question on an exam	Math 4210 88%	Students successfully met this objective over the 70% threshold.	None
	Measure 2: Course pass rate	Math 4210 91% passed	Students successfully met this objective over the 70% threshold.	None
3.A: Demonstrate ability to think critically by proving mathematical conjectures and establishing theorems from calculus.	Measure 1: Question on an exam	Math 4210 73%	Students successfully met this objective over the 70% threshold.	None
	Measure 2: Course pass rate	Math 4210 91% passed	Students successfully met this objective over the 70% threshold.	None
4.A: Demonstrate an intuitive and computational understanding of continuity, differentiation, and integration through calculations and solving application problems.	Measure 1: Question on an exam	Math 4210 88%	Students successfully met this objective over the 70% threshold.	None
	Measure 2: Course pass rate	Math 4210 91% passed	Students successfully met this objective over the 70% threshold.	None
5.A: Know, understand, and be able to apply the concepts of metric spaces to establish	Measure 1: Question on an exam	Math 4220 70%	Students successfully met this objective at the 70% threshold.	None

Evidence of Learning: MATH 4210/4220 Introductory Real Analysis				
Measurable Learning Outcome	Method of Measurement	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
Students will...	Direct and Indirect Measures*			
theorems and prove conjectures in a clear and mathematically correct way.	Measure 2: Course pass rate	Math 4220 75% passed	Students successfully met this objective over the 70% threshold.	None
6.A: Know, understand, and be able to apply the concepts of sequences and functions to establish theorems and prove conjectures in a clear and mathematically correct way.	Measure 1: Question on an exam	Math 4220 73%	Students successfully met this objective over the 70% threshold.	None
	Measure 2: Course pass rate	Math 4220 75% passed	Students successfully met this objective over the 70% threshold.	None

Additional narrative (optional – use as much space as needed): The department mostly suspended the evidence of learning spread sheets for 2014/15 due to its moving and relocation in temporary offices spread about campus. Faculty will be instructed to complete additional data collection in 2015/16.

b. Evidence of Learning: High Impact or Service Learning

If you provide students with high impact or service learning opportunities briefly describe those opportunities and explain how you assess their impact on student learning. This [excerpt](#) from George D. Kuh provides a brief overview of high-impact practices.

There were only a few students that arranged Senior Projects. The students made presentations about their work in an open forum. These were very successful.

The only Capstone course, MTHE 4010 will be assessed in 2015/2016.

c. Evidence of Learning: General Education Courses
Evidence of Learning: QL Courses – Fall 2014

There are 5 objectives for QL courses. These objectives are the same for every course and are not tied directly to the course contents.

QL Objective 1: Interpret mathematical models such as formulas, graphs, tables, and schematics, and draw inferences about them.

QL Objective 2: Represent mathematical information symbolically, visually, numerically, and verbally.

QL Objective 3: Use arithmetical, algebraic, geometric, and statistical methods to solve problems.

QL Objective 4: Estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives, and select optimal results.

QL Objective 5: Recognize that mathematical and statistical methods have limits.

The direct measure (measure 1) used was one question per objective in the final exam in each course in almost* all sections. These final exams are comprehensive and have the lowest average of all exams. Students' course average scores are higher than their final exam scores. However, the final exams provide a uniform measure across all sections. The indirect measure (measure 2) is the individual course pass rates and success rates**.

Based on Bloom's Taxonomy and how closely an objective is tied to the course content, two different thresholds are used for objectives 1-3 and 4-5.

* Some instructors did not correctly assess the objectives.

** Passing rate = (# of students with a course grade of "C" or better) / (# of students who completed the course)

Evidence of Learning: QL Courses – Fall 2014

There are 5 objectives for QL courses. These objectives are the same for every course and are not tied directly to the course contents.

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QL Objective 2: Represent mathematical information symbolically, visually, numerically, and verbally.

QL Objective 3: Use arithmetical, algebraic, geometric, and statistical methods to solve problems.

QL Objective 4: Estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives, and select optimal results.

QL Objective 5: Recognize that mathematical and statistical methods have limits.

The direct measure (measure 1) used was one question per objective in the final exam in each course in all sections. These final exams are comprehensive and have the lowest average of all exams. Students' course average scores are higher than their final exam scores. However, the final exams provide a uniform measure across all sections. The indirect measure (measure 2) is the individual course passing rate*.

Based on Bloom's Taxonomy and how closely an objective is tied to the course content, two different thresholds are used for objectives 1-3 and 4-5.

* Passing rate = (# of students with a course grade of "C" or better) / (# of students who completed the course)

Math 1030, Math 1040 and Math 1080 have met their thresholds for two consecutive semesters. Departmental assessment will resume in future.

Evidence of Learning: Math 1050 (26 ¹ sections , 752 students)					
Measurable Learning Outcome	Measure 1: Average Score	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
	Measure 2: Course passing rate				
QL Objective 1	Measure 1	75%	85% ²	Students successfully met this objective.	None
	Measure 2	70%	82% ³	Students successfully met this objective.	None.
QL Objective 2	Measure 1	75%	75% ⁴	Students successfully met this objective.	None
	Measure 2	70%	82%	Students successfully met this objective.	None
QL Objective 3	Measure 1	75%	83% ⁵	Students successfully met this objective.	None
	Measure 2	70%	82%	Students successfully met this objective.	None
QL Objective 4	Measure 1	65%	69% ⁶	Students successfully met this objective.	None
	Measure 2	70%	82%	Students successfully met this objective.	None
QL Objective 5	Measure 1	65%	88%	Students successfully met this objective.	None
	Measure 2	70%	82%	Students successfully met this objective.	None

1. Actual number of sections is higher since some CE classes were listed under the same CRN.
2. This rate increased from 82% in Spring 2014 to 85% in Fall 2014.
3. The pass rate in Spring 2014 was 80%.
4. This rate has moved in a narrow range from 72% in Fall 2013 to 76% in Spring 2014 and to 75% in Fall 2014.
5. This rate increased from 78% in Spring 2014 to 83% in Fall 2014.
6. This rate has increased over the last year from 62% in Fall 2013 to 65% in Spring 2014 and to 69% in Fall 2014.

Math 1050 has now met its thresholds for two consecutive semesters. Departmental assessment will resume in future.

G. Summary of Artifact Collection Procedure

Artifact	Learning Outcome Measured	When/How Collected?	Where Stored?
Final Exams	Learning Outcomes	End of semester	Paper in Department files
Student Projects/Papers	Student success	End of semester	Department files
Chi Tester Outcome Report on teaching evaluations	Teaching	End of semester	a. Electronic format (chi tester warehouse) b. Paper, stored in department files
Pass rates	Student success	End of Semester	Electronic copies
Graduate Exit surveys	Overall program, graduate and employment rate	Graduation Sign Off Chi Tester Survey	Electronic copies
Major Survey	Major opinions	Chi Tester Survey	Electronic copies

Summary Information (as needed)

Appendix A

Most departments or programs receive a number of recommendations from their Five-Year Program Review processes. This page provides a means of updating progress towards the recommendations the department/program is acting upon.

Date of Program Review: April 2013	Recommendation	Progress Description
Recommendation 1	Text of recommendation	
Hire extra Faculty	The most pressing challenge facing the Department is the need for extra faculty resources. More faculty are needed to offer required courses more routinely and to lessen the dependence on adjunct faculty. We urge the central administration to take this seriously.	<p>July 2013 The department hired one additional tenure track faculty who started in July of 2013. This was a replacement for a faculty that left at the end of 2011-2012.</p>
		<p>Fall 2013 The department is currently performing a search for professor to fill a position vacated during 2012-2013 due to a retirement.</p>
		<p>Spring 2014 The department performed a faculty search for a new tenure track position. Three of the top candidates had so many offers that they declined the on campus interviews. As we were in the process of making an offer to an excellent applicant he accepted an alternate position. When we wanted to make an offer to another extremely qualified applicant he was not approved by the Dean. No specific reasons for the action were given.</p> <p>Fall 2014 The department was recently authorized to make a search again this</p>

		<p>year. This time the position is open to an applicant specializing in Statistics.</p> <p>July of 2015 There were only a few candidates for the faculty search of 2014/15. In spite of this a qualified faculty was hired, this was a replacement for a retired faculty.</p>
Recommendation 2	Text of recommendation	
Pursue Grants	<p>We also encourage the Department to pursue external funding opportunities, like the NSF's Noyce Grants, in order to build capacity. Writing such a large grant, particularly for the first time, is a serious, time-consuming activity, but the payoff is potentially very substantial. The College of Science should therefore consider making a small investment (in the form of faculty release time) to catalyze this process. The College should also consider bringing in consultants (for example, PIs on existing Noyce grants in Utah) to guide the Department's grant-writing activities.</p>	<p>Fall 2013 The Departmental Assessment Planning committee has been charged with locating grants opportunities that would be appropriate and accessible.</p> <p>Fall 2014 Nothing new to report.</p> <p>Fall 2015 Nothing New to report in the area of state and national grants. A few faculty applied for internal grants. A couple of these were funded.</p>
Recommendation 3	Text of recommendation	
Increase Advising	<p>Increase personalized advising for the purpose of recruitment and retention. Consider hiring advanced undergrads for this purpose. Also consider hiring work-study students for some of the routine administrative tasks.</p>	<p>Spring 2013 The department chair began assigning a personalized faculty advisor/mentor to each newly declared math major.</p>
		<p>Summer and Fall 2013 A faculty mentor/advisor was assigned to each active current major. These lists</p>

		<p>have been posted in the Math Student Room. Post cards were also sent to each of these majors informing them of their faculty mentor and advising them to set up an appointment to see their advisor if they had questions.</p> <p>Spring 2014 and Fall 2014 All majors are being assigned faculty mentors. During spring 2014 the Math Club had a meet your mentor meeting. It went well.</p> <p>Fall 2015 The department has been assigning faculty members as additional advisers/mentors to all new majors and current majors. The majors like having additional advising opportunities. The Chair continues to make any exceptions to programs of study.</p>
<p>Recommendation 4</p>		
<p>Pursue alternative approaches in Gateway courses</p>	<p>Success rates are high in gateway courses such as Math 1050 and 1210, but faculty should be encouraged, possibly by being offered teaching release time, to pursue alternative approaches to these courses to further build on their strong success rates. Alternative approaches should be studied for effectiveness and then modified, discarded, or expanded as appropriate.</p>	<p>Faculty have been attending conferences on math teaching methods. They have reported on those conferences. Faculty have been using and evaluating these ideas and techniques in their courses.</p> <p>Fall 2014 Faculty are using and evaluating the new approaches.</p> <p>Fall 2015 Faculty continue to try alternative approaches to engage students. The</p>

		success in getting students to read the material ahead of class has been low.
Recommendation 5		
Consider implementing uniform final exams and possibly uniform midterm exams in courses up to and including Calculus I with multiple-choice questions for some portion.	Implementing uniform examinations is a simple (but high-impact) strategy with multiple benefits. Uniform examinations with common grading help ensure uniform standards. Common examinations promote cooperation among the faculty and provide savings in time and effort. Instructors in courses with common exams are perceived more as a coach and mentor instead of a gatekeeper. The Department should consider using multiple-choice questions for some portion of examinations as many mathematical tasks can be appropriately assessed using them. Course coordinator positions would be needed (to oversee the final exam writing and visit the classrooms of adjunct faculty). Course coordinators could be compensated with release time.	<p>Fall 2013, The department curriculum committees is seriously considering common final exams in Math 1050, 1210, and 2012. It may help students retain the needed skills in subsequent courses.</p> <p>Fall 2014 This is still being considered but delayed due to moving to temporary quarters due to the construction of the new COS building.</p> <p>Fall 2015 A committee was set up to oversee this but other demands such as audits, moving to new quarters, changes in the prerequisites for lower level courses has made progress slow. But, this appears to be on schedule to occur in Fall of 2016, due to the need to reserve a Block of time available and record that in the Final Exam schedule.</p>
Recommendation 6		
Mentor new faculty	Consider instituting appropriate procedures for the orientation of new contract/adjunct faculty.	Fall 2014 The faculty established guidelines for mentoring new tenure track faculty. These are being followed.
Recommendation 7		

Rewrite Mission Statement and Strategic Plan	The Department would benefit from the development of a better strategic plan with clear priorities.	Fall 2014 The Assessment /Planning Committee has been charged with this Task, but delayed due to the move to temporary quarters during the construction of the new COS building.
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Additional narrative:

Appendix B

Please provide the following information about the full-time and adjunct faculty contracted by your department during the last academic year (summer through spring). Gathering this information each year will help with the headcount reporting that must be done for the final Five Year Program Review document that is shared with the State Board of Regents.

Faculty	
Headcount	
With Doctoral Degrees (Including MFA and other terminal degrees, as specified by the institution)	
Full-time Tenured	9
Full-time Non-Tenured (includes tenure-track)	4
Part-time	3
With Master's Degrees	
Full-time Tenured	1
Full-time Non-Tenured	
Part-time	9
With Bachelor's Degrees	
Full-time Tenured	
Full-time Non-tenured	
Part-time	18
Other	
Full-time Tenured	
Full-time Non-tenured	
Part-time	
Total Headcount Faculty	10
Full-time Tenured	4
Full-time Non-tenured	
Part-time	30

Please respond to the following questions.

- 1) Based on your program's assessment findings, what subsequent action will your program take?
Continue to request additional faculty and full time contract instructors since it is very difficult to oversee all the adjunct professors. With at most one adjunct retreat a year and review of their final exams it is difficult to ascertain if they are providing appropriate instruction. They provide traditional lecture based instruction.

- 2) Are there assessment strategies within your department or program that you feel are particularly effective and/or innovative? If so, what are those strategies and what do you learn about your students by using them? *The strategies are not particularly effective nor innovative, but they do ascertain if students are learning the material except for those faculty that lower their standards to attain good results.*