

# Assessment: Reporting Unit Four Column

## Mathematics - B.S.

<i>Objectives</i>	<i>Assessment Methods</i>	<i>Results/Observations</i>	<i>Meaningful Changes</i>
<p><b>16-20 BS Mathematics, PLLO 1</b>  <b>Communication:</b> - Students will read, create, write, and orally communicate mathematical ideas.  <b>Objective Status:</b> Active  <b>Objective Type (Control-click to select multiple):</b> 16-20 Plan, B.S. Mathematics, Communication Skills Learning Objective, Program-Level Learning Objectives (PLLO)</p>	<p>Students in MAT 301 (Logic and Set Theory) will write and present a proof in class.  <b>Criterion:</b> Starting in Fall 2016: At least 75% of Mathematics majors will score 80% or higher on a written and oral presentation of a proof in MAT 301 (Logic and Set Theory). Prior to Fall 2016: At least 75% of Mathematics majors will score 70% or higher on a written and oral presentation of a proof in MAT 301 (Logic and Set Theory).  <b>Schedule:</b> During spring and fall semesters.  <b>Who will use the data (How and When)?:</b> The Math Programs Committee will examine the data each year.</p>		
	<p>Students will complete an oral presentation in the capstone course, MAT 498.  <b>Criterion:</b> At least 75% of mathematics majors will be evaluated at 70% or higher on their presentation.  <b>Schedule:</b> During each spring semester.  <b>Who will use the data (How and When)?:</b> The Math Programs Committee will examine the data</p>		

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<p><b>16-20 BS Mathematics, PLLO 2</b>  <b>Technology:</b> - Students will solve problems using technical computing software.  <b>Objective Status:</b> Active  <b>Objective Type (Control-click to select multiple):</b> 16-20 Plan, B.S. Mathematics, Critical Thinking Learning Objective, Program-Level Learning Objectives (PLLO)</p>	<p>each year.</p> <p>Mathematics majors will solve a problem on the MAT 239 (Linear Algebra and Matrices) final that involves technical computing.  <b>Criterion:</b> At least 75% of Mathematics majors will score 2 or higher on a departmental rubric or 70% or higher on a problem on the MAT 239 (Linear Algebra and Matrices) final that involves technical computing.  <b>Schedule:</b> During the spring and fall semesters.  <b>Who will use the data (How and When)?:</b> The Math Programs Committee will examine the data each year.</p>	<p><b>Result Status:</b> Result Closed-No further action needed  <b>Result/Observation Type:</b> Strength  From 2013-2014: Four Mathematics majors scored 100% on a problem on the MAT 214 final that involved computations. Hence <math>4/4 = 100\%</math> of students scored 70% or higher on a representative problem on the MAT 214 final. (MAT 214 is now MAT 239.)</p> <p>While these results are satisfactory, some MAT 214 instructors did not submit papers, and the problem that was used did not necessarily involve software or calculators. This and faculty observations indicated a possible need for the inclusion of more technology in the program. (05/01/2017)</p> <p><b>Related Documents:</b>  <a href="#">MAT 527 Curriculum Change Form</a>  <a href="#">MAT 565 Curriculum Change Form</a>  <a href="#">MAT 577 Curriculum Change Form</a>  <a href="#">EKU 2014-2015 Undergraduate Catalog</a>  <a href="#">EKU 2015-2016 Undergraduate Catalog</a>  <a href="#">MAT 540 Curriculum Change Form</a></p>	<p><b>Meaningful Changes:</b> The creation of the following courses officially went into effect in Fall 2015: MAT 527, Cryptology; MAT 565, Mathematical Methods for Protein Structure Analysis; and MAT 577, Introduction to Algebraic Coding Theory. (The Math Programs Committee and the Department of Mathematics and Statistics voted in 2014-2015 to create these courses.) These courses are attached to 700-level courses that were created as part of revisions to the M.A. in Applied Mathematics program. However, they also provide undergraduates with more opportunities to be exposed to technology and applications.</p> <p>The course creations can be confirmed by comparing pages 323-324 in the 2014-2015 Undergraduate Catalog (<a href="http://catalogs.eku.edu/sites/catalogs.eku.edu/files/files/UG_Catalog_1415_web.pdf">http://catalogs.eku.edu/sites/catalogs.eku.edu/files/files/UG_Catalog_1415_web.pdf</a>) with pages 329-330 in the 2015-2016 Undergraduate Catalog (<a href="http://catalogs.eku.edu/sites/catalogs.eku.edu/files/files/EKU%20Undergraduate%20Catalog%202015-2016%20with%20Links.pdf">http://catalogs.eku.edu/sites/catalogs.eku.edu/files/files/EKU%20Undergraduate%20Catalog%202015-2016%20with%20Links.pdf</a>). (05/01/2017)</p>
			<p><b>Meaningful Changes:</b> The Math Programs Committee and the Department of Mathematics and</p>

<i>Objectives</i>	<i>Assessment Methods</i>	<i>Results/Observations</i>	<i>Meaningful Changes</i>
		<p>Students will present a mathematical topic using mathematical typesetting software and presentation software in the capstone course, MAT 498.</p> <p><b>Criterion:</b> At least 75% of mathematics majors will score 70% or higher on the technology assignment.</p> <p><b>Schedule:</b> During each spring semester.</p>	<p>Statistics voted to revise MAT 540, Introductory Applied Mathematics in Spring 2015, but it went forward to the Council on Academic Affairs in Fall 2015. This course is attached to a 700-level course that was modified as part of revisions to the M.A. in Applied Mathematics program. However, it also provides undergraduates with more opportunities to be exposed to technology and applications.</p> <p>The course revision can be confirmed by comparing page 329 in the 2015-2016 Undergraduate Catalog (<a href="http://catalogs.eku.edu/sites/catalogs.eku.edu/files/files/EKU%20Undergraduate%20Catalog%202015-2016%20with%20Links.pdf">http://catalogs.eku.edu/sites/catalogs.eku.edu/files/files/EKU%20Undergraduate%20Catalog%202015-2016%20with%20Links.pdf</a>) with page 331 in the 2016-2017 Undergraduate Catalog (<a href="http://catalogs.eku.edu/sites/catalogs.eku.edu/files/files/2016-17%20Undergraduate%20Catalog_EKU.pdf">http://catalogs.eku.edu/sites/catalogs.eku.edu/files/files/2016-17%20Undergraduate%20Catalog_EKU.pdf</a>). (05/01/2017)</p>

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<p><b>16-20 BS Mathematics, PLLO 3</b>  <b>Problem-solving:</b> - Students will demonstrate mastery of problem-solving skills typically needed in graduate work and industry.  <b>Objective Status:</b> Active  <b>Objective Type (Control-click to select multiple):</b> 16-20 Plan, B.S. Mathematics, Critical Thinking Learning Objective, Program-Level Learning Objectives (PLLO)</p>	<p>Mathematics majors will solve a theoretical problem in MAT 315 (Introduction to Analysis).  <b>Criterion:</b> At least 75% of Mathematics majors will score 2 or higher on a departmental rubric or 70% or higher on a representative theoretical problem in MAT 315 (Introduction to Analysis).  <b>Schedule:</b> During each spring semester.  <b>Who will use the data (How and When)?:</b> The Math Programs Committee will examine the data each year.</p>	<p><b>Result Status:</b> Result Closed-No further action needed  <b>Result/Observation Type:</b> Strength  From 2014-2015: Approximately two out of eight Mathematics majors (25%) scored at the 50th percentile or higher on the Major Field Test. (The department did not pay to get the percentile information, so we compared the scores to an old percentile chart.) (04/30/2017)  <b>Related Documents:</b>  <a href="#">MAT 254 Syllabus Fall 2015</a>  <a href="#">MAT 525 Syllabus Fall 2015</a></p>	<p><b>Meaningful Changes:</b> One instructor of MAT 254, Calculus III, increased the frequency of assessment through the device of "Twenty Questions," in the form of weekly in-class short questions. The change increased student contact with the material, in the sense that, in addition to online WebAssign problems, students would also practice with calculus techniques in the setting of a classroom, in line with what they experience less frequently in the form of tests.</p>
	<p>Students will take the Major Field Test in Mathematics in the capstone course.  <b>Criterion:</b> At least 75% of Mathematics majors will score at the 25th percentile or higher on the Major Field Test in Mathematics.  <b>Schedule:</b> During the spring and fall semesters.  <b>Who will use the data (How and When)?:</b> The Math Programs Committee will examine the data each year.</p>	<p><b>Result Status:</b> Result Closed-No further action needed  <b>Result/Observation Type:</b> Strength  From 2014-2015: Approximately two out of eight Mathematics majors (25%) scored at the 50th percentile or higher on the Major Field Test. (The department did not pay to get the percentile information, so we compared the scores to an old percentile chart.) (04/30/2017)  <b>Related Documents:</b>  <a href="#">MAT 254 Syllabus Fall 2015</a>  <a href="#">MAT 525 Syllabus Fall 2015</a></p>	<p><b>Meaningful Changes:</b> One instructor of MAT 254, Calculus III, increased the frequency of assessment through the device of "Twenty Questions," in the form of weekly in-class short questions. The change increased student contact with the material, in the sense that, in addition to online WebAssign problems, students would also practice with calculus techniques in the setting of a classroom, in line with what they experience less frequently in the form of tests.</p>
			<p>Evidence is provided in the Fall 2015 MAT 254 syllabus. (04/30/2017)  <b>Meaningful Changes:</b> One instructor of MAT 525, Vector Analysis with Applications, increased the importance of homework through the device of weighting that form of assessment with a greater multiplier in the</p>

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<p><b>16-20 PLLO 4: Minor in Mathematics</b> - Students will demonstrate mastery of basic problem-solving skills. <b>Objective Status:</b> Active <b>Objective Type (Control-click to select multiple):</b> 16-20 Plan, Critical Thinking Learning Objective, Program-Level Learning Objectives (PLLO)</p>	<p>Students in MAT 244/244H (Calculus II) will solve a problem or complete a project that requires critical thinking and problem-solving skills. <b>Criterion:</b> At least 75% of Mathematics minors will score 2 or higher on a departmental rubric or 70% or higher on a problem/project in MAT 244/244H (Calculus II) that requires critical thinking and problem-solving skills. <b>Schedule:</b> During spring and fall semesters. <b>Who will use the data (How and When)?:</b> The Math Programs Committee will examine the data each year.</p>		<p>final grade calculation. The change increased student perception of the value of practicing the techniques and working with the ideas of manifolds and vector analysis, beyond merely short-term studying for a few tests.</p> <p>Evidence is provided in the Fall 2015 MAT 525 syllabus. (04/30/2017)</p>
<p><b>16-20 PLLO 5: Minor in Mathematical Sciences</b> - Students will demonstrate mastery of basic problem-solving skills. <b>Objective Status:</b> Active <b>Objective Type (Control-click to select multiple):</b> 16-20 Plan, Critical Thinking Learning Objective, Program-Level Learning Objectives (PLLO)</p>	<p>Students in MAT 224/224H (Calculus II) will solve a problem or complete a project that requires critical thinking and problem-solving skills. <b>Criterion:</b> At least 75% of Mathematical Sciences minors will score 2 or higher on a departmental rubric or 70% or higher on a problem/project in MAT 224/224H (Calculus II) that requires critical thinking and problem-solving skills.</p>		

*Objectives*

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*Results/Observations*

*Meaningful Changes*

**Schedule:** During spring and fall semesters.  
**Who will use the data (How and When)?:** The Math Programs Committee will examine the data each year.