

Student Outcomes Assessment and Success Report AY2017-18

Completed reports due from the dean to the Assessment Office via Blackboard by October 15. Deans, assessment coordinators, and/or department chairs set their own internal deadlines for material review and request for refinement if not suitably addressing questions.

Unit/Program Name: _____ MS in Mathematics _____ **Contact Name(s) and Email(s)** Cheng Zhao, _____ cheng.zhao@indstate.edu _____

Before you complete the form below, review your outcomes library and curriculum map to ensure that they are accurate and up to date. If not, you may submit a new version along with this summary. Templates are available on the [assessment website](#).

Part One

<p>a. What learning outcomes did you assess this past year?</p> <p>If this is a graduate program, indicate the Graduate Student Learning Outcome* each outcome aligns with.</p>	<p>b. (1) What assignments or activities did you use to determine how well your students attained the outcome? (2) In what course or other required experience did the assessment occur?</p>	<p>c. What expectations did you establish for achievement of the outcome?</p>	<p>d. What were the actual results?</p>	<p>e. What changes or improvements were made or will be made in response to these assessment results or feedback from previous year's report?</p>
<p>Objective 1: Students will learn to use and construct mathematical proofs. Outcome 1.1: Students will construct direct proofs. G4, G5</p>	<p>Measure: problems on Homework or Quiz or Exam Course: Math 510, Math 512, 530, 531, 537, 541, 542, 612, 613</p>	<p>Target: 80% of the students completing and passing the course will be assessed by the committee as meeting or exceeding expectations</p>	<p>More than 80% of the work by students are correct</p>	<p>Graduate faculty professors continue to provide more challenged and updated mathematical materials for student's further study</p>
<p>Objective 1: Students will learn to use and construct mathematical proofs. Outcome 1.2: Students will construct proofs by contradiction. G4, G5</p>	<p>Measure: problems on Homework or Quiz or Exam Course: Math 510, Math 512, 530, 531, 537, 541, 542, 612, 613</p>	<p>Target: 80% of the students completing and passing the course will be assessed by the committee as meeting or exceeding expectations</p>	<p>More than 80% of the work by students are correct</p>	<p>Graduate faculty professors continue to provide more challenged and updated mathematical materials for student's further study</p>
<p>Objective 1: Students will learn to use and construct mathematical proofs. Outcome 1.3: Students will construct proofs by induction.</p>	<p>Measure: problems on Homework or Quiz or Exam Course: Math 510, Math 512, 530, 531, 537, 541, 542, 612, 613</p>	<p>Target: 80% of the students completing and passing the course will be assessed by the committee as meeting or exceeding expectations.</p>	<p>More than 80% of the work by students are correct</p>	<p>Graduate faculty professors continue to provide more challenged and updated mathematical materials for student's further study.</p>

G4, G5				
<p>Objective 1: Students will learn to use and construct mathematical proofs.</p> <p>Outcome 1.4: Students will construct examples and counterexamples. G4, G5</p>	<p>Measure: problems on Homework or Quiz or Exam</p> <p>Course: Math 510, Math 512, 530, 531, 537, 541, 542, 612, 613</p>	<p>Target: 80% of the students completing and passing the course will be assessed by the committee as meeting or exceeding expectations.</p>	<p>More than 80% of the work by students are correct</p>	<p>Graduate faculty professors provided more challenged and updated mathematical materials for student's further study.</p>
<p>Objective 2: Students will communicate mathematics effectively.</p> <p>Outcome 2.1: Students will state mathematical results accurately for a research problem. G4, G5</p> <p>Outcome 2.2: Students will conduct an independent investigation of their own problems. G4, G5</p> <p>Outcome 2.3: Students will make an oral presentation of their own research report that is accessible to their peers. G1</p> <p>Outcome 2.4: Students will make a detailed written report of their research. G1, G2</p>	<p>Measure: Student interview with course professor.</p> <p>Courses: Math 695</p>	<p>Target: 80% of the students completing and passing the course will be assessed by the committee as meeting or exceeding expectations.</p>	<p>The students in the math 695 class are working on their research paper. One student in each semester taking Math 695 and Graduate with MS degree.</p>	<p>Students presented research topics in class as well as in the form of online presentation organized by program director and peers: Fall 2017, Dr. Chi Spring 2018, Dr. Chi The synchronous and asynchronous online "smart classroom" presentation environment helps us a lot.</p>
<p>Objective 3: Students will demonstrate that they are ready to use their mathematical skills in a post-master's position.</p> <p>Outcome 3.1: Students will be polled after graduation to determine whether they planned to pursue further studies, had an offer of employment, etc. G1, G2</p>	<p>Measure: Students will be interviewed by the department chair or the chair's representative.</p>	<p>Target: 80% of the students completing and seminar will meet expectations (be happy with their placement) or exceed expectation (be very happy with their placement)</p>	<p>There are one graduate student graduate in Fall 2017. One student graduate in Spring 2018. One student graduate in Summer 2018.</p>	<p>The synchronous and asynchronous online "smart classroom" presentation environment helps us a lot.</p>

<p>Objective 3: Students will demonstrate that they are ready to use their mathematical skills in a post-master's position.</p> <p>Outcome 3.2: Students will demonstrate mastery of mathematics and related content that will allow them to pursue careers utilizing their knowledge. G1, G2</p>	<p>Measure: grade point average in mathematics and related coursework</p>	<p>Target: 80% of the graduating students will meet expectations (at least 3.25 but less than 3.75) or exceed expectation (at least 3.75)</p>	<p>The graduating student is exceed expectation</p>	<p>By utilizing online resources and equipment, students demonstrate mastery of mathematics and related content that will allow them to pursue careers utilizing their knowledge.</p>
--	--	--	---	---

Note: If you would like to report on more than three outcomes, place the cursor in the last cell on the right and hit "tab" to add a new row.

Notes

- a. Use your outcomes library as a reference.
- b. Each outcome must be assessed by at least one direct measure (project, practica, exam, performance, etc.). If students are required to pass an examination to practice in the field, this exam must be included as one of the measures. At least one of the program's outcomes must use an indirect measure (exit interview, focus group, survey, etc.). Use your curriculum map to correlate outcomes to courses.
- c. Identify the score or rating required to demonstrate proficiency (e.g., Students must attain a score of "3" to be deemed proficient; at least 80% of students in the program will attain this benchmark."
- d. Note what the aggregate level of proficiency actually was and the number of students included in the cohort or sample (e.g., "85% of the 25 students whose portfolios were reviewed met the established benchmark").

Part 1b: Continuous Quality Improvement

In no more than one page, summarize 1) the discoveries assessment has enabled you to make about student learning (a. What specifically do students know and do well—and less well? b. What evidence can you provide that learning is improving?); 2) what your assessment plan will focus on in the coming year; and 3) how will this information be shared with other stakeholders?

The Mathematics faculty finalized major changes to the master's program in mathematics. These changes should facilitate a growth in our enrollments by making the program more modern and more flexible. In addition, the graduate courses will be offered synchronous/asynchronous online and on campus with the use of "smart classrooms." This change has already increased and will continue to increase our enrollments in the program.

Part 2a: Summary of Student Success Activities

Based on the results of your assessment of student learning outcomes from Part 1 above, reflect on how this data will impact student success within your unit/program.

a. What goals/objectives were established this past year to aid student performance, retention, persistence, and completion?	b. What primary action steps were taken to make progress on each goal and who was responsible?	c. What data informs progress on each goal?	d. What were some accomplishments or achievements for each goal and/or challenges confronted?	e. Please indicate goals that are continuing and any goals that will replace a previous goal. Any additional goals can also be added on a new line.
<p><u>Objective 2:</u> Students will communicate mathematics effectively.</p> <p><u>Objective 3:</u> Students will demonstrate that they are ready to use their mathematical skills in a post-master's position.</p>	<p>Students will state mathematical results accurately for a research problem.</p> <p>Students will conduct an independent investigation of their own problems.</p> <p>Students will make an oral presentation of their own research report that is accessible to their peers.</p> <p>Students will make a detailed written report of their research.</p> <p>Students will demonstrate mastery of mathematics and related content that will allow them to pursue careers utilizing their knowledge.</p>	<p>There are 28 graduate students who are taking our graduate courses in this semester. Half of the graduate students are on-campus and half of them are distance graduate students. There are more graduate students continue to study in PhD programs. In particular, last December, one of our graduate master student found an assistant professor position in a university at Indiana.</p>	<p>Some accomplishments are: we have more graduate students in our graduate program in mathematics and there are more graduate students found more academic teaching and research positions/jobs. Since there are more distance graduate students enrolled in the graduate program in mathematics, the challenges confronted are the use of "smart classrooms."</p>	<p>These goal that are continuing are: Students will communicate mathematics effectively and Students will demonstrate that they are ready to use their mathematical skills in a post-master's position.</p>
2.				
3.				

Notes

- a. These goals could be program/department wide but may also be focused on specific sub-populations of interest (e.g., service course student performance, transfer students, part-time students, students of a particular class year, students of color, etc.).
- c. Retention and completion data, D/F/drop rates, credit hour productivity (defined as credit hour enrollment at start of term versus credit hours earned at end of term) are common data examples. See [Blue Reports](#) database (access from Linda Ferguson in Institutional Research) or the [Office of Institutional Research](#) for ideas.

Part 2b: Continuous Quality Improvement

In no more than one page, summarize 1) the discoveries that attention to student performance, retention, persistence, and completion has enabled you to make about program/department systems, processes, and norms as it effects students; and 2) how this will positively impact student success, including with regard to the readiness of students for graduate study or a career?

The Mathematics faculty finalized major changes to the master’s program in mathematics by making the program more modern and more flexible. In addition, that the graduate courses are offered synchronous/asynchronous online and on campus with the use of “smart classrooms” enhance our program significantly. For example, there are 28 graduate students who are taking our graduate courses in this semester. Half of the graduate students are on-campus and half of them are distance graduate students. The enrollment is more than doubled. There are more graduate students continue to study in PhD programs. In particular, last December, one of our graduate master student found an assistant professor position in a university at Indiana. We will continue to offer more high quality synchronous/asynchronous online graduate courses and research projects.

AY2017-18 Graduate Student Enrollment in Mathematics: 12

AY2017-18	Graduate Courses offered	Enrollment	Retention Rate
Fall 2017	Math510 Introduction to Analysis (Nora)	1	100%
	Math512 Abstract Algebra (Liz)	4	100%
	Math530 Real Variable (Cheng)	6	100%
	Math541 Theory of Probability (Vin)	2	100%
	Math613 Applied Linear Algebra (Henjin)	5	100%
	Math695 Math Research	2	100%
Spring 2018	Math511 Number Theory (Jodi)	2	100%
	Math513 Linear Algebra (Henjin)	1	100%
	Math537 Modeling (Henjin)	9	100%
	Math524 Theory of Statistics (Vin)	1	100%
	Math612 Commutative Algebra (Nora)	2	50%
	Math695 Math Research (Henjin)	1	100%

Please prepare this report as a Word document. Do not include any attachments. Instead, provide links to important supporting materials (e.g., detailed—but not student-specific—assessment results; rubrics; minutes; etc.), or upload them to the college’s assessment site in Blackboard.

Dear Cheng,

Thank you so much for sharing your assessment process and findings for AY 2017-18 with the Assessment and Student Success Councils. You will find a comprehensive synthesis of the feedback compiled by both groups below. It is understood that some of the feedback might encompass practices that you already engage in but that are not documented in this report. As the purpose of this evaluation is focused on recognizing great work and helping faculty improve assessment practice, it is not necessary to retroactively add documentation. Please feel free to let me know if you have any questions or if there is any way I can assist you in further developing assessment in your program.

This report will be shared with the Associate Dean(s) and Dean of your college and summarized findings will be shared as composite college/institutional data with the President's Office and the Provost's team.

Sincerely,

Kelley (x7975)

Program: MS Mathematics	
Assessment Practice Overall Rating: Developing (1.56/3.00)	
Student Success Practice Overall Rating (notes below in blue): Developing (1.00/3.00)	
Strengths	Recommendations
<ul style="list-style-type: none">• Clear and specific learning outcomes that are tied directly into Graduate Student Learning Outcomes.• Excellent use of diverse assignments, interviews, and activities across the curriculum to indicate student learning at different points in time.• Some information is provided about using results.	<ul style="list-style-type: none">• Specifying which problems and/or specific quizzes/exams correspond to which learning outcomes will help ensure evaluation of student learning is reported relative to these specific outcomes. This will help with analysis of findings and be more useful in decision-making regarding student learning.• It is noted that 80% will be assessed by the committee as meeting or exceeding expectations, but there is no indication of what those levels of achievement mean (a certain score on a test, a certain level on a rubric, etc.). Specifying this will be helpful.• Reporting the results in the same terms as the established targets is a more useful way to evaluate success. Instead of reporting more than 80% of the work by students was correct, it would align better with your target to say 100% of students achieved higher than 80% on their assignments.• While students are performing well overall, more detailed use of the addition challenges or updated materials provided and why they are provided would help establish your use of results to inform such decisions.• Add a note about how faculty in the program are informed of findings and involved in conversations about using them to make decisions regarding student learning.

- | | |
|--|--|
| | <ul style="list-style-type: none">• For student success goals, focus more on addressing continuous assessment and go beyond student recruitment goals. |
|--|--|

Assessment (Parts 1a & 1b) Scoring Rubric is included below with notations. Student Success (Parts 2a & 2b) Scoring Rubric is included below with no notations just for your reference (the SSC did not choose to report in this way).

Score was calculated on a 0 (undeveloped), 1 (developing), 2 (mature), 3 (exemplary) scale.

Evaluation Criteria	Exemplary	Mature	Developing	Undeveloped
<p>Student Learning Outcomes</p>	<p>At least one learning outcome that is aligned with program coursework is assessed this cycle.</p> <p>Learning outcome(s) is specific, measurable, and student-centered.</p> <p>Rationale for assessment of this outcome(s) is made clear (ex: it is part of a standing assessment cycle, a need was identified, etc.)</p> <p>Learning outcome(s) directly link to college, institutional, and/or accreditor goals/standards.</p>	<p>At least one learning outcome that is aligned with program coursework is assessed this cycle.</p> <p>Learning outcome(s) is specific, measurable, and student-centered.</p> <p>Rationale for assessment of this outcome(s) is made clear (ex: it is part of a standing assessment cycle, a need was identified, etc.)</p>	<p>At least one learning outcome that is aligned with program coursework is assessed this cycle.</p> <p>Learning outcomes(s) is measurable.</p>	<p>No learning outcomes are identified for assessment or the outcomes that are identified are not linked to program outcomes aligned with program coursework (e.g. – curriculum map) or are not measurable.</p>
<p>Performance Goals & Measures</p>	<p>Performance goal identified for each learning outcome is clear and reasonable (ex: based on previous performance data, professional standards, etc.).</p> <p>Identified measures are designed to accurately reflect student learning, including at least one direct measure.</p> <p>Tools used to measure student performance are described and were reviewed for validity or trustworthiness prior to use (note this in the report; attach tools if applicable – ex: rubrics, checklists, exam keys, etc.).</p>	<p>Performance goal identified for each learning outcome is clear and reasonable (ex: based on previous performance data, professional standards, etc.).</p> <p>Identified measures are designed to accurately reflect student learning, including at least one direct measure.</p> <p>Tools or processes for evaluating student performance on measures are described (attach tools if applicable – ex: rubrics, checklists, exam keys, etc.).</p>	<p>Performance goal(s) is identified for each learning outcome.</p> <p>Identified measures (ex: assignments, projects, tests, etc.) are poorly suited to performance goals or are solely indirect measures.</p> <p>Tools or processes for evaluating student performance on measures are not described.</p>	<p>No goals for student performance of learning outcomes is identified, and/or no measures are provided.</p>

Analysis & Results	<p>Data is collected using the measures and tools identified.</p> <p>Results are reported with clear description of quality analysis (e.g., analysis follows accepted statistical or qualitative procedures).</p> <p>Results are shared in relation to performance goals.</p> <p>Results are discussed in relation to college, institutional, and/or accreditor goals/standards.</p>	<p>Data is collected using the measures and tools identified.</p> <p>Results are reported with clear description of analysis (e.g., analysis follows accepted statistical or qualitative procedures).</p> <p>Results are shared in relation to performance goals.</p>	<p>Data is collected using the measures and tools identified.</p> <p>Results are reported with little description of analysis.</p>	<p>No data is being collected.</p> <p>No results are provided.</p>
Sharing & Use of Results for Continuous Improvement	<p>Clear information is provided about sharing and using results to inform practice.</p> <p>Discussion of what was learned from results is provided and connected to plans for sharing and using results to inform practice.</p> <p>A plan for adjusting performance, goals, assessment, and/or program components based on results is outlined.</p>	<p>Clear information is provided about sharing and using results to inform practice.</p> <p>Discussion of what was learned from results is provided and connected to plans for sharing and using results to inform practice.</p>	<p>Limited information is provided about sharing or using results to inform practice.</p> <p>Some discussion of what was learned from results is provided.</p>	<p>No information is provided about sharing or using results to inform practice.</p> <p>No evidence of reflection on results is provided (ex: discussion, conclusions drawn)</p>
Overall Rating	<input type="checkbox"/> Exemplary	<input type="checkbox"/> Mature	<input checked="" type="checkbox"/> Developing	<input type="checkbox"/> Undeveloped

Student Success Activities Report Rubric (Part 2 of Student Outcomes Assessment Report)Unit/Program:

Office of Student Success/Office of Assessment & AccreditationEvaluation Date:

Evaluation Criteria	0 Undeveloped	1 Developing	2 Mature	3 Exemplary
Goals/ Objectives	No goals/objectives are identified.	Goals/objectives are poorly suited to addressing student performance, retention, persistence, and/or completion. Goals/objectives may also be modest at best such that little effort is required.	Goals/objectives are generally clear and reasonably well suited to addressing student performance, retention, persistence, and/or completion. Goals/objectives are also generally at least moderately aggressive such that appropriate effort is required.	Goals/objectives are all clear and well suited to addressing student performance, retention, persistence, and/or completion. Goals/objectives are also at least moderately aggressive in all cases such that appropriate effort is required.
Action Steps	No action steps are identified.	Action steps are weak, underdeveloped, and/or poorly suited to making progress on goals/objectives. No person(s) or group(s) indicated who will be responsible for the actions.	Action steps are generally clear and reasonably well suited to making progress on goals/objectives. Person(s) or group(s) responsible for the actions are indicated in most cases.	Action steps are all clear and well suited to making progress on goals/objectives Person(s) or group(s) responsible for each action are indicated, ideally with a timeline.
Data that Informs Progress on Each Goal/Objective	No data, quantitative or qualitative, is identified.	Data to inform progress are poorly suited to measure progress on goals/objectives.	Data to inform progress are generally well suited to measure progress on goals/objectives.	Data to inform progress are all well suited to measure progress on goals/objectives.
Assessment of Outcomes and Continuous Improvement	For goals/objectives in place the prior year, no reflection provided on achievements/challenges, sharing results, and/or plans for improvement or change based on results. No reflection on outcome assessment plan for continuous improvement provided for new goals/objectives.	For goals/objectives in place the prior year, modest at best reflection provided (and/or is vague or of questionable connection to results) on achievements/challenges, sharing results, and/or plans for improvement or change based on results. Modest at best reflection on assessment plan for continuous improvement provided for new goals/objectives.	For goals/objectives in place the prior year, generally appropriate reflection provided (and is reasonably well connected to results) on achievements/challenges, sharing results, and/or plans for improvement or change based on results. Reasonable reflection on assessment plan for continuous improvement provided for new goals/objectives.	For goals/objectives in place the prior year, strong reflection is provided in all cases (and is well connected to results) on achievements/challenges, sharing results, and/or plans for improvement or change based on results. Well-developed reflection on assessment plan for continuous improvement provided for new goals/objectives.
Overall Rating	<input type="checkbox"/> Undeveloped	<input type="checkbox"/> Developing	<input type="checkbox"/> Mature	<input type="checkbox"/> Exemplary