

Student Outcomes Assessment and Success Report AY2019-20 *Consult with your college dean's office regarding due date and how to submit. Deans will submit reports to the Office of Assessment & Accreditation annually by October 15.*

Unit/Program Name: Mathematics

Contact Name(s) and Email(s) Vin Isaia: vin.isaia@indstate.edu and Liz Brown: liz.brown@indstate.edu

Part 1a: Summary of Student Learning Outcomes Assessment

a. What learning outcomes did you assess this past year? If this is a graduate program, identify the Graduate Student Learning Outcome each outcome aligns with.	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?	c. What were your expectations for student performance?	d. What were the actual data/results?		e. What changes or improvements were made or will be made in response to these assessment results or feedback from previous year's report? <i>Can expand on this in Part 2.</i>
1. A.5.1	A problem covering epsilon-delta proof was used. MATH 310	80% Recognition 50% Execution	Unaware-1 Recognized only-4 Executed-5	10% 40% 50%	Recognition and execution are at or above threshold. Focus will be on maintaining this in upcoming cycles.
2. B.2.1	A problem covering computation of z-scores. MATH 241	75% Recognition 50% Execution	Unaware-47 Recognized only-37 Executed-154	19.75% 15.55% 64.71%	Recognition and execution are above threshold. Focus will be on maintaining this in upcoming cycles.
3. B.4.1	A problems covering graph transformations. MATH 122	90% Recognition 50% Execution	Unaware-1 Recognized only-5 Executed-6	8.33% 41.67% 50%	Recognition is above while execution is at threshold. Focus will be on maintaining this in upcoming cycles.
4. C.1.1	A problem covering volume for solid of revolution. MATH 132	90% Recognition 50% Execution	Unaware-7 Recognized only-17 Executed-24	14.58% 35.42% 50%	Recognition is below and execution is at threshold. Focus will be on reducing unawares for the next cycle.
5. C.1.3	A problem covering hypothesis testing for population proportion. MATH 241	75% Recognition 33.3% Execution	Unaware-64 Recognized only-102 Executed-72	26.89% 42.86% 30.25%	Both recognition and execution are just below threshold. Focus will be on reducing unawares for next cycle.
6. E.1.1	Submission of the senior project. MATH 494	90% Recognition 50% Execution	Unaware-0 Recognized only-3 Executed-2	0% 60% 40%	Recognition is above while execution is at threshold. Focus will be on maintaining this in upcoming cycles.

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.*

Helpful Hints for Completing this Table

- a. Use your outcomes library as a reference. Note any alignment with professional standards, as applicable.
- b. Each outcome should 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 should 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. Describe or attach any evaluation tools such as rubrics, scales, etc.
- 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: Review of Student Success Data & Activities

Use Blue Reports to generate the following information (as well as any other information helpful to you):

- 1) Cohort Sizes 10 current majors
- 2) Year-to-Year Retention Fall 2017 – 59.30% Fall 2018 – 65.38% Fall 2019 – 68.75%
- 3) 5-Year Graduation Rate Fall 2013 – 20.00% (No Fall 2014 value)

What worked well in supporting student success this year?

Concerning 241, the structure of the Math Lab, along with the course structure that the department has built are key pieces that allow students who utilize them to be successful. The course 310, which will be assessed in the near future was designed to be a smooth entrance ramp to a very tough subject. The hope is the introduction of the material in a pre-cursor course will allow people to be successful in the follow up version (MATH 410). MATH 494 was changed to a 3 credit course to give students more incentive to partake in the research and writing aspects with more diligence than was observed in the 1 credit version.

What are the most significant opportunities for improvement upon which to focus in the coming year?

Calculus II is not a strong suit for the Math Lab in terms of support, so bridging that gap between the upper level courses and the expertise of the Math Lab is an opportunity for improvement. The same can be said for all courses above Calculus II.

Part 1c: Summary of Career Readiness Activities

Please submit your Career Readiness Competencies curriculum map along with this report as a separate attachment. You can find the template here: <https://www.indstate.edu/assessment/plan-components>

Part 2: Continuous Quality Improvement

Reflect on the information shared above regarding student learning, success, and career readiness. In no more than one page, summarize:

- 1) **the discoveries assessment and data review have enabled you to make about student learning, success, and career readiness** (ex: What specifically do students know and do well—and less well? What evidence can you provide that learning is improving? How might learning, success, and career readiness overlap? What questions do your findings raise?)

Box 2e and 3e show that more students than expected were at the corresponding levels. It remains to see if they will continue above threshold. The statistics problems show both sides: students struggle more with a tough statistics concept (Box 5e), along with larger than normal number of students can be successful with statistics (Box 2e.). Being able to translate `fuzzy' information into a solvable form would aid a student's career readiness as does success in a tough environment. Box 4e is adequate as far as execution goes, but does lag in recognition, which will be addressed before the next cycle.

2) findings-based plans and actions intended to improve student learning and/or success (expansion of Part 1a, box e as needed)

For box 1e, normally this assessment would have occurred in the previous semester, which so MATH 310 was not running. There is opportunity to assess proof mechanisms in the upcoming cycles. Also, 310 may be assessed indirectly using the other mechanism's information before 310's next occurrence in the cycle. Box 3e and 6e, and to a lesser extent 4e have small sizes, so that a change by just one in a category can significantly increase/decrease the percentages and as such those percentages need to be interpreted carefully. Box 2e and 5e contain problems for which higher unawares may occur more frequently than would be expected, due to those problems being primarily more `verbal' than is typical in `math' problems and they may not have recognized this version (i.e. the directions don't state `do this kind of problem').

3) what your assessment plan will focus on in the coming year

The next cycle has a different round of outcomes, along with different courses, being assessed. There will be some standardization between recognition and execution thresholds by using this cycle to guide what the appropriate levels are for the next two cycles, which are new.

4) how this information will be shared with other stakeholders

The course MATH 241 has planning meetings at the beginning and towards the end of the semester. The rest of the courses fall under the umbrella of the Math Group. The results of the assessment will be shared via e-mail with the chairs of those committees, who will distribute the data to members as they see fit. At their next available meeting, the committees will discuss the results as well as interpret why they are happening, and then suggest any changes that could be made to facilitate improving the recognition, as well as the execution levels that are being reached.

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.

Thank you so much for sharing your assessment process and findings for AY 2019-20 with the Assessment Council. You will find feedback and ratings on the rubric below. It is understood that some of the feedback might encompass practices that you already engage in but were 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 practice and use 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: B.S. Mathematics	Overall Rating: Mature (2.06/3.00)
Strengths	Recommendations
<ul style="list-style-type: none"> • Measures for assessment of student learning are very specifically tailored and clear. • Expectations for student performance are clearly stated. • Actual performance is clearly described, and brief, thoughtful analysis is provided of evaluation and follow-up actions. • Good discussion is provided of student performance in light of most important areas for focus and limitations about what conclusions can be drawn. • Clear information about how faculty are involved in assessment and how results are shared. 	<ul style="list-style-type: none"> • Be sure to include the language of the learning outcomes in future reports so I can provide better evaluation and feedback on outcomes and on measures/evaluative tools. • 50% of students being able to execute the outcome seems like a low expectation. Is this due to the small number of students in the program, or are there other factors? Consider whether you would expect them to perform higher, or add a note about why so low. • If future data suggests students are struggling in the same areas illustrated by this year's data, add notes about the strategies that will be taken to improve learning.

Evaluation Criteria	3 Exemplary	2 Mature	1 Developing	0 Undeveloped
<p>Student Learning Outcomes</p>	<p>Identified, aligned learning outcomes are specific, measurable, student-centered, and program-level. Outcomes directly integrate institution or college-level learning goals.</p> <p>Outcomes are consistent across modes of delivery (if applicable).</p> <p>More than one outcome is assessed this cycle, and rationale is provided for why they were selected for assessment.</p>	<p>Identified, aligned learning outcomes are specific, measurable, student-centered, and program-level. Outcomes support institution or college-level learning goals.</p> <p>Outcomes are consistent across modes of delivery (if applicable).</p> <p>At least one outcome is assessed this cycle, and rationale is provided for why it was selected for assessment.</p>	<p>Learning outcomes are identified and alignment with courses is demonstrated.</p> <p>Outcomes are consistent across modes of delivery (if applicable).</p> <p>At least one outcomes is assessed this cycle.</p>	<p>No (program) learning outcomes are identified, and/or alignment of learning outcomes to courses is not demonstrated (e.g. – curriculum map).</p>
<p>Performance Goals & Measures</p>	<p>Performance goals are clear and appropriate, and rationale is provided for why these were selected.</p> <p>Identified measures and tools are assigned to each outcome, are clear and intentionally designed to address student performance on aligned outcomes, and rationale and examples are provided (e.g. – rubrics, checklists, exam keys). Most are direct measures, and their design enhances the validity of findings.</p> <p>Licensure exams and high-impact practices are reflected in measures (if applicable).</p>	<p>Performance goals are clear and appropriate.</p> <p>Identified measures and tools are assigned to each outcome, are clear and intentionally designed to address student performance on aligned outcomes, and examples are provided (e.g. – rubrics, checklists, exam keys). At least one direct measure is included.</p>	<p>Performance goals are identified with little rationale or clarity. (see recommendations)</p> <p>Identified measures are poorly suited to performance goals, underdeveloped, or are solely indirect measures.</p>	<p>No goals for student performance of learning outcomes are identified, and/or no measures are provided.</p>

<p>Analysis & Results</p>	<p>Data collection process is clear and designed to produce valid/trustworthy results. The process is useful to those collecting and/or interpreting data.</p> <p>Data is collected and analyzed with clear rationale and description.</p> <p>Results are provided with thoughtful discussion of analysis and description of conclusions that can be drawn.</p>	<p>Data collection process is clear and designed to produce valid/trustworthy results.</p> <p>Data is collected and analyzed with clear rationale and description.</p> <p>Results are provided with some discussion of analysis.</p>	<p>Description of data collection is unclear as to process and quality.</p> <p>Some data is collected and analyzed with little rationale or description.</p> <p>Some results are provided with no discussion of analysis.</p>	<p>No information is provided about the data collection process, and/or no data is being collected.</p> <p>No results are provided</p>
<p>Sharing & Use of Results for Continuous Improvement</p>	<p>A plan for sharing information and included program faculty and appropriate staff in discussion and planning is detailed and enacted. Outcomes and results are easily accessible on the program website or other appropriate designated area.</p> <p>Plans for improvement or change based on results are clear and connected to results. If few students met performance goals, this is included in discussion and plans.</p> <p>Reflection if offered about results or plans moving forward, and compares prior year plans to current outcomes in an effort to foster continuous improvement as a result of assessment process.</p>	<p>A plan for sharing information broadly across program faculty is detailed and enacted.</p> <p>Plans for improvement or change based on results are clear and connected to results. If few students met performance goals, this is included in discussion and plans.</p> <p>Reflection is offered about results or plans moving forward.</p>	<p>Information is provided about sharing results, but sharing is limited in scope or content.</p> <p>Plans for improvement or change based on results are incomplete, vague, or not clearly connected to results.</p> <p>Little reflection is offered about results or plans moving forward.</p>	<p>No information is provided about sharing results and/or plans for improvement or change based on results.</p> <p>No evidence of reflection on results in provided.</p>
<p>Overall Rating</p>	<p><input type="checkbox"/> Exemplary</p>	<p><input checked="" type="checkbox"/> Mature</p>	<p><input type="checkbox"/> Developing</p>	<p><input type="checkbox"/> Undeveloped</p>

Please see reviewer notes for more details.