Math Department Assessment Plan Overview
Updated: 12/30/2017

Outcomes	Objectives	1. Mathematics BA/BS	1a. Elementary Cert	1b. Secondary Cert.	1c. Non-cert
Outcomes describe essential knowledge, skills, or behaviors program completer exhibit.	Outcomes are too broad to be measurable. Objectives narrow the focus.	**Instrument, Location, and Timeline** In GVAssess, a Measure consists of an assessment instrument, location, and timeline, and many other relevant details. In this overview, we are only documenting the instrument, location, and timeline. The rest of the details will be filled out within GVAssess when the measure is created.			
A. Beliefs. Math majors have productive beliefs about mathematics [ALL]	A.1. Demonstrate significant growth in views about mathematics as they progress through the major.	VAMS in MTH 210 and MTH 495/96 (F17, F18)			
		ATMI in MTH 210 and MTH 495/96 (W17,Su17, W18,Su18)			
B. Abstract Reasoning. Math majors reason abstractly and critique the reasoning of others. [ALL]	B.1. Apply abstract reasoning skills to make sense of definitions and proofs.	R&C Rubric (MTH 495) (W17-F18)			R&C Rubric (Rows A and B); (W17-W18)
		R&C Rubric (MTH 350) (W18-W19)			
C. Problem Solving. Math majors are effective problem solvers. [ALL]	C.1. Utilize problem solving strategies to solve applied problems.	MTH 227 project and rubric (TBD from R&C Rubric) (W19-W20)			
D. Communication. Math majors use the language of mathematics to communicate with precision. [ALL]	D.1. Use appropriate mathematical vocabulary and symbols to communicate with precision.	MTH 350 Rubric (TBD from R&C Rubric) (W18-W19)			R&C Rubric (Rows C and D)(W17-W18)

Comments

This assessment plan is our adaptation of the one we created after our last strategic plan. That was before GVAssess, so it was based on two broad goals and four broad outcome/objective (hybrid) SLOs. We broke apart the SLOs but preserved the spirit of the plan, and we adding a few areas of focus based on recent observations.

The VAMS and ATMI instruments are externally validated instruments for measuring attitudes and beliefs about learning and doing mathematics. We are using both measures to triangulate our results.
We adapted the instruments to a Google Forms survey and administer the VAMS in all Fall sections and the ATMI in all Winter sections. Note: It would also be reasonable to adminster the assessments in a random sample of sections.

Outcome B and Objective 1 apply to all majors and to the non-certification emphasis, but the expectation is higher for the non-cert majors. In GVAssess, it is the Measure that ties the Outcome and Objectives to a specific sub-entity.

The R&C Rubric is an end-of-semester evaluation of students based on coursework submitted throughout the semester. The instrument measures two constructs: reasoning (rows A and B) and communication (rows C and D).
We are adapting the R&C Rubric for use in other courses. In some cases, the rubric will be linked to an individual assignment (such as the MTH 227 rubric).

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E. Content Knowledge. Math majors have strong mathematical content knowledge. [ALL]	E.1. TBD	TBD			TBD	We just recently added this outcome to our assessment plan after realizing there are key understandings we hope all graduates have but that our assessment plan did not address. We have not yet had time to discuss the details.
ELE-A Content Knowledge. Elementary majors have specialized content knowledge for teaching children mathematics. [ELE]	ELE-A.1. Elementary majors will have high pass rates on the state-required Michigan Test for Teacher Certification (MTTC).		MTTC pass rates (Overall and Subarea)(F16-W21)			
	ELE-A.2. Elementary majors will demonstrate proficiency with combinatorics.		MTH 315 rubric & assessment task (TBD)(F18-F19)			MTH 315 is required for this emphasis but is taken by other students too. The assignment will be integrated into the course for all students, but the rubric used for our SLO assessment will only be reported for students in this emphasis.
ELE-B Pedagogical Knowledge. Elementary majors have pedagogical knowledge for teaching children mathematics. [ELE]	ELE-B.1. Elementary majors will design and implement assessment activities to evaluate children's statistical thinking.		MTH 323 assessment project rubric (CAEP) (W18-W21)			CAEP is our accrediting body. We are using part of the assessment we've developed and implement every semester for CAEP, and we will use GVAssess to record and track the results for our SLO assessment as well.
	ELE-B.2. Elementary majors will engage children in productive mathematical discussions		EDI 430 Observation rubric (TBD W18)			This is a new objective we have created based on informal observations of our students. By developing a rubric and tracking over time, we will compile an evidence based to back up our informal observations.
SEC-A Content Knowledge. Secondary majors have specialized content knowledge for teaching secondary math. [SEC]	SEC-A.1. Secondary majors will have high pass rates on the state-required Michigan Test for Teacher Certification (MTTC).			MTTC Overall and Subarea pass rates (F16-W21)		This is another area we already track for our accreditation, and including it in SLO assessment is both efficient and lets us use GVAssess to track the results over time.
	SEC-A.2. Secondary majors will demonstrate the ability to use			MTH 331 Assessment (CAEP) (W18-W21)		The accreditation assessment upon which this measure is based is much broader than we need, so we will focus on the relevant aspects. This lets us efficiently track this objective, which we have identified as an essential skill for these students.

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		Instrument, Location, and Timeline In GVAssess, a Measure consists of an assessment instrument, location, and timeline, and many other relevant details. In this overview, we are only documenting the instrument, location, and timeline. The rest of the details will be filled out within GVAssess when the measure is created.			
	correct axiomatic reasoning in proofs involving principles of Euclidean and non-Euclidean geometries.				
SEC-B Pedagogical Knowledge. Secondary majors have strong pedagogical knowledge for teaching secondary mathematics. [SEC]	SEC-B.1. Facilitate lessons in which students are engaged in significant mathematical discourse.			EDI 331-432 Field Evaluation (TBD)	

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The instrument used here will be similar to the EDI 430 rubric, but it will be applied to different students and in a different setting (secondary vs. elementary).