

Student Learning Outcomes Program Assessment Curriculum Map

Curriculum maps illustrate the link between the courses and requirements in a program, to the program learning outcomes. Maps represent where students are given the opportunity to achieve the outcomes, from introduction to mastery, as they proceed through the curriculum.

(Form expands to accommodate program outcomes; add lines as necessary.)

Academic Program: MS and PhD in Mathematics		Reporting Year: 2019																					
<p>Program Student Learning Outcomes: Explicit statements of observable, measurable results that specify what a student is expected to know or be able to do as a result of their participation in an academic program. Statements should be detailed and meaningful enough to guide decisions in program planning, improvement, pedagogy, and practice.</p>		<p>Course Numbers/Program Requirements Program requirements can include internships, service learning, portfolios, comprehensive exams, seminars, and requirements that may not be associated with a course number.</p>																					
		<p>Course Numbers/Program Requirements:</p>																					
Program Student Learning Outcomes:		MTH 435	MTH 513	MTH 436	MTH 5XX	MTH 591		MTH 515	MTH 535	MTH 536	MTH 525	MTH 562		MS Comps		Oral Comp	PhD Comp	PhD Thesis	PhD Defense				
1.1	Graduates can state, use and prove essential results in broad areas of mathematics.	I	I	R	E			R	R	E				E									
1.2	Graduates can state, use and prove essential results in a specialized subject.		I	E	E						R	E		E		E	E						
1.3	Graduates can set up and perform advanced computations.	I	R	E	E			R	E		E			E			E						
1.4	Graduates can construct rigorous mathematical arguments.	I	I	R	E			R	R	E	E	E		E			E	E	E				
2.1	Graduates can conduct and critically report on reviews of the literature in mathematics topic areas.					I										R		E	E				
2.2	Graduates can write a research paper in a specialized subject.					I												E					
3.1	Graduates can effectively communicate mathematics orally.					I										E				E			
3.2	Graduates can effectively communicate mathematics in writing.	I	I	R	R	E								E			E	E					

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Included above are the core courses for the MS and PhD in Mathematics (Pure track). There are no required courses for the PhD in Applied Mathematics. However, all students are required to take a selection of “specialization” courses at the 500-level, where many program outcomes are taught. This is indicated in the MTH 5XX column in the above table. In particular, our MS students will obtain mastery in outcome 1.2 in (at least) one of these courses. Such courses include MTH 518, 581, 555, 547, 548, 542, 545 as well as the core courses for the PhD program.

Program Goals

#1	Graduates can demonstrate a command of general mathematics and/or the specialized discipline in their area of interest by applying mathematical arguments and techniques.
#2	Graduates can critically review and/or produce research in at least one area of mathematics.
#3	Graduates can communicate mathematics effectively to multiple audiences.

It was decided that the previous program goals were unsatisfactory, so we have decided to amend them. The two main issues we found were the following.

- Goal 3 mentioned the ability “to perform computations”, but this was not mentioned in either learning outcome 3.1 or 3.2.
- There was some overlap between goals 1 and 3.

To rectify these issues, it was decided to combine goals 1 and 3 together and add a learning outcome explicitly focused on computation (outcome 1.3, above). We realize that these learning goals will have to continuously amended and improved in the future, but are relatively happy with the current language as a basis for these later revisions.