MATHEMATICS (MS)

Loyola's Master of Science in Mathematics degree is a highly customizable program supporting students with a variety of career goals. Beyond delivering foundational knowledge in the discipline, its focus on critical-thinking, organizational, technological, and communication skills leaves students well-prepared for their next step.

STEM Designation

The MS in Mathematics has been granted a STEM designation from the U.S. Department of Homeland Security. International students completing degrees with this designation can qualify for extended OPT (Optional Practical Training), bringing the total OPT time granted to 36 months.

Related Programs

Master's

- Applied Statistics (MS) (https://catalog.luc.edu/graduate-professional/graduate-school/arts-sciences/mathematics-statistics/applied-statistics-ms/)
- Data Science (MS) (https://catalog.luc.edu/graduate-professional/graduate-school/arts-sciences/data-science/data-science-ms/)

Curriculum

The Master of Science in Mathematics requires 27 credit hours of coursework, a one-credit professional development seminar during the first semester, and a two-credit practicum during the final semester, for a total of 30 credit hours.

Coursework includes required foundational courses in algebra, analysis, and statistics, as well as 18 credit hours of electives chosen from courses in Mathematics and cognate fields (such as Applied Statistics, Data Science, and Computer Science). With their practicum, students design and independently execute a research project under faculty supervision.

Code	Title	Hours
Foundational Course Requirements		
MATH 416	Survey of Algebra	3
MATH 454	Survey of Analysis	3
MATH 404 / STAT 404	Probability & Statistics I [1]	3
or STAT 408	Applied Regression Analysis	
Depth Requirement Courses		
Algebra or Analysis.		3
MATH 414	Algebra II	
MATH 415	Topics in Linear Algebra	
MATH 452	Analysis II	
MATH 453	Complex Analysis	
Cognate Fields. [1]		3
MATH 405 / STAT 405	Probability & Statistics II	
STAT 410	Categorical Data Analysis	
COMP 429	Natural Language Processing	
COMP 487	Deep Learning	
DSCI 401	Introduction to Data Science	
Or Another Course with Graduate Program Director Approval [2]		
Additional Requirements		
MATH 401	Introduction to Graduate Study in Mathematics	1
MATH 495	Graduate Practicum in Mathematics	2
Select four approved 400-level Electives in Mathematics or Statistics [3]		12
Total Hours		**30**

[1] Students who select MATH 404/STAT 404 in Foundational Courses may opt to take STAT 408 as a Depth Course, and vice versa.

[2] The depth requirement for Cognate Fields may be fulfilled by other courses, including courses from other departments, with approval of Graduate Program Director.

[3] Approved elective courses should be selected with advice of Graduate Program Director to complement student's previous learning and support future plans.

Suggested Sequence of Courses

The below sequence of courses is meant to be used as a suggested path for completing coursework. An individual student's completion of requirements depends on course offerings in a given term as well as the start term for a major or graduate study. Students should consult their advisor for assistance with course selection.

Course	Title	Hours
Year 1		
Fall		
MATH 401	Introduction to Graduate Study in Mathematics	1
MATH 404 / STAT 404 or STAT 408	Probability & Statistics I or Applied Regression Analysis	3
MATH 415 or MATH 453	Topics in Linear Algebra [1] or Complex Analysis	3
400-level Math/Stat Elective		3
	Hours	**10**
Spring		
MATH 405 / STAT 405 or STAT 410	Probability & Statistics II [2] or Categorical Data Analysis	3
MATH 416	Survey of Algebra	3
MATH 414 or MATH 452 or 400-level Math/Stat Elective	Algebra II [1] or Analysis II	3
	Hours	**9**
Year 2		
Fall		
MATH 454	Survey of Analysis	3
400-level Math/Stat Elective		3
400-level Math/Stat Elective		3
MATH 495	Graduate Practicum in Mathematics	2
	Hours	**11**
	Total Hours	**30**

[1] Students need only take one of MATH 414, MATH 415, MATH 452, or MATH 453 to fulfill the mathematics depth requirement for the program.

[2] Or another course fulfilling the cognate fields depth requirement for the program.

Graduate & Professional Standards and Regulations

Students in graduate and professional programs can find their Academic Policies in Graduate and Professional Academic Standards and Regulations (https://catalog.luc.edu/academic-standards-regulations/graduate-professional/) under their school. Any additional University Policies supersede school policies.

Learning Outcomes

Graduates of the Master of Science in Mathematics Program will:

- be able to construct mathematical proofs of basic theorems, and to write these proofs clearly using correct grammatical constructs and appropriate mathematical notation;
- have seen applications of mathematics to areas across mathematical disciplines and outside of mathematical disciplines;
- receive the training sufficient for acceptance into PhD programs or professional schools, or for hire in mathematics related industries;
- receive training on how to act responsibly and ethically within the discipline.