

# MATHEMATICS (MA)

## Master of Arts in Mathematics

Unit: College of Arts and Sciences (<http://louisville.edu/artsandsciences/intro/>) (GA)

Department: Mathematics (<https://louisville.edu/math/>)

Program Webpage (<https://louisville.edu/math/graduate/>)

Academic Plan Code(s): MATHMA, MATHMA\_ACC

## Program Information

The University of Louisville Department of Mathematics is a research-oriented department that prides itself on delivering first-rate graduate instruction. There is a broad range of courses and ample opportunities to interact with faculty. The Department also maintains an active colloquium series with talks given by visiting mathematicians, statisticians and scientists.

Appropriate preparation for a Master of Arts in Mathematics is undergraduate coursework equivalent to a major in mathematics from an accredited university. This should include a one-year course in either analysis or abstract algebra, equivalent to MATH 501-MATH 502 and MATH 521-MATH 522 at the University of Louisville. Candidates who have not taken both must complete them by the end of the second year of their MA program.

## Accelerated BA/BS-MA Option in Mathematics

Students must apply for admission to the program no later than the end of their junior year to be eligible enroll in graduate coursework in their final year of the program and must have completed MATH 205, MATH 206, MATH 301, and MATH 325, or equivalent courses, prior to application.

Applicants must have a minimum overall GPA of 3.5, and minimum GPA of 3.66 in mathematics courses. As part of the combined degree, students must complete MATH 405 and at least four of the following: MATH 501, MATH 502, MATH 521, MATH 522, MATH 561, MATH 562, or MATH 581, including at least one sequence from among these courses.

The student may take a maximum of nine (9) credit hours for graduate credit, which will also apply to the requirements for the baccalaureate degree in Mathematics. All 600-level courses numbered 689 or below qualify, as do 500-level courses when completed in accord with the stipulations for graduate credit outlined in the syllabus.

## Admission Requirements

Apply online (<http://louisville.edu/graduate/apply/>) via the Graduate School.

Complete applications require the following:

1. Complete application form (<http://louisville.edu/graduate/apply/>) along with paid application fee.
2. Cover letter to math department including any information you believe will help process your application. **Please indicate in this letter whether you are interested in a GTA position**, for example.
3. Transcripts (an official copy for each undergraduate institution attended. UofL transcripts are automatically submitted).

4. Letters of recommendation (<https://louisville.app.box.com/s/w9jkkbu3cg10q7jtbwxo5rdkn2d1mjaa/>) (at least two, preferably three; electronic recommendations preferred).
5. **Recent** (within three years) GRE scores (only the general exam is required).
6. All applicants for whom English is a second language must also submit official TOEFL scores of 79 or higher on the internet-based test, 213 or higher on the computer-based test, or 550 or higher on the paper-based test for verification of English proficiency. English proficiency can also be met by submitting official IELTS scores of at least 6.5 overall band score from the academic module exam.

## Degree Requirements

1. Candidates must complete a program of study approved by the department. All courses (maximum of twelve (12) credit hours total) taken outside the Department of Mathematics must have prior departmental approval.
2. All students must complete a minimum of 30 credit hours of non-thesis graduate credit, including at least fifteen (15) credit hours in Mathematics (MATH) courses numbered 601-689. Non-Thesis Option students must complete at least one full-year sequence in Mathematics (MATH) courses numbered 601–689; Thesis Option students are required to complete at least two full-year sequences in Mathematics (MATH) courses numbered 601–689.
3. Students must satisfy one of the following three requirements:
  - **Master's Level Examination Option:** Pass written examination in three areas of mathematics chosen from a list prepared by the department. At most, two attempts are allowed. Examinations will be approved and administered by the departmental Graduate Studies Committee.
  - **Thesis Option:** Write a thesis on an advanced topic in the mathematical sciences. A total of two full-year sequences among courses numbered 601 through 689 must be completed.
  - **PhD Qualifier Option:** Pass two qualifier examinations for the departmental PhD Program. These examinations need not be taken together and each may be attempted at most twice.
4. Students choosing the Thesis Option must pass a final oral examination described under Requirements for the Master's Degree (<http://catalog.louisville.edu/graduate/general-policies-procedures-requirements/degree-requirements/>).

## Thesis Option Coursework

Code	Title	Hours
<b>Core Courses</b>		<b>12</b>
Choose two full-year sequences from the following:		
MATH 601 & MATH 602	Real Analysis I Real Analysis II	
MATH 621 & MATH 622	Algebra I Algebra II	
MATH 681 & MATH 682	Combinatorics and Graph Theory I Combinatorics and Graph Theory II	
MATH 635 & MATH 636	Mathematical Modeling I Mathematical Modeling II	
MATH 663 & MATH 664	Theory of Probability I Theory of Probability II	
MATH 667 & MATH 668	Statistical Inference Linear Statistical Modeling	

<b>Non-Thesis Elective Courses</b> <sup>1,2</sup>	<b>18</b>
<b>Thesis Coursework (optional)</b>	<b>0-6</b>
MATH 695 Thesis Guidance	
Minimum Total Hours	30-36

- <sup>1</sup> All courses taken outside the Department of Mathematics must have prior departmental approval.
- <sup>2</sup> Must include at least three (3) credit hours of Mathematics (MATH) coursework numbered 601-689 (see list below). May include up to twelve (12) credit hours of approved coursework outside of the department.

### Non-Thesis Option Coursework

Code	Title	Hours
<b>Core Courses</b> <b>6</b>		
Choose one full-year sequences from the following:		
MATH 601 & MATH 602	Real Analysis I Real Analysis II	
MATH 621 & MATH 622	Algebra I Algebra II	
MATH 681 & MATH 682	Combinatorics and Graph Theory I Combinatorics and Graph Theory II	
MATH 635 & MATH 636	Mathematical Modeling I Mathematical Modeling II	
MATH 663 & MATH 664	Theory of Probability I Theory of Probability II	
MATH 667 & MATH 668	Statistical Inference Linear Statistical Modeling	
<b>Elective Courses</b> <sup>4,5</sup>		<b>24</b>
Minimum Total Hours		30

- <sup>4</sup> All courses taken outside the Department of Mathematics must have prior departmental approval.
- <sup>5</sup> Must include at least nine (9) credit hours of Mathematics (MATH) coursework numbered 601–689 (see list below). May include up to twelve (12) credit hours of approved coursework outside of the department.

### MATH 601–689 Courses

Code	Title	Hours
<b>Graduate Course List</b>		
MATH 601	Real Analysis I	
MATH 602	Real Analysis II	
MATH 605	Functional Equations I	
MATH 606	Functional Equations II	
MATH 607	Seminar on Applied Analysis	
MATH 611	Complex Variables I	
MATH 612	Complex Variables II	
MATH 621	Algebra I	
MATH 622	Algebra II	
MATH 631	Group Theory	
MATH 633	Rings and Ideals	
MATH 635	Mathematical Modeling I	
MATH 636	Mathematical Modeling II	

MATH 641	Topology I
MATH 642	Topology II
MATH 663	Theory of Probability I
MATH 664	Theory of Probability II
MATH 667	Statistical Inference
MATH 668	Linear Statistical Modeling
MATH 670	Introduction to the Stochastic Calculus
MATH 673	Actuarial Models I
MATH 674	Actuarial Models II
MATH 676	Actuarial Modeling I
MATH 677	Actuarial Modeling II
MATH 681	Combinatorics and Graph Theory I
MATH 682	Combinatorics and Graph Theory II
MATH 683	Advanced Combinatorics and Graph Theory I
MATH 684	Advanced Combinatorics and Graph Theory II
MATH 687	Seminar on Discrete Mathematics