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 online 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 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 or Duolingo score of 105.

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 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td></td>
<td>Core Courses</td>
<td></td>
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<tr>
<td></td>
<td>Choose two full-year sequences from the following:</td>
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<tr>
<td>MATH 601</td>
<td>Real Analysis I</td>
<td>12</td>
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<tr>
<td>&amp; MATH 602</td>
<td>Real Analysis II</td>
<td></td>
</tr>
<tr>
<td>MATH 621</td>
<td>Algebra I</td>
<td></td>
</tr>
<tr>
<td>&amp; MATH 622</td>
<td>Algebra II</td>
<td></td>
</tr>
<tr>
<td>MATH 681</td>
<td>Combinatorics and Graph Theory I</td>
<td></td>
</tr>
<tr>
<td>&amp; MATH 682</td>
<td>Combinatorics and Graph Theory II</td>
<td></td>
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<tr>
<td>MATH 635</td>
<td>Mathematical Modeling I</td>
<td></td>
</tr>
<tr>
<td>&amp; MATH 636</td>
<td>Mathematical Modeling II</td>
<td></td>
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<tr>
<td>MATH 663</td>
<td>Theory of Probability I</td>
<td></td>
</tr>
<tr>
<td>&amp; MATH 664</td>
<td>Theory of Probability II</td>
<td></td>
</tr>
<tr>
<td>MATH 667</td>
<td>Statistical Inference</td>
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</tr>
<tr>
<td>&amp; MATH 668</td>
<td>Linear Statistical Modeling</td>
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</tbody>
</table>
Non-Thesis Elective Courses $^{1,2}$ 18
Thesis Coursework (optional) 0-6
MATH 695 Thesis Guidance

Minimum Total Hours 30-36

1 All courses taken outside the Department of Mathematics must have prior departmental approval.
2 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Core Courses 6</td>
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Choose one full-year sequences from the following:

- MATH 601 Real Analysis I
- & MATH 602 Real Analysis II
- MATH 621 Algebra I
- & MATH 622 Algebra II
- MATH 681 Combinatorics and Graph Theory I
- & MATH 682 Combinatorics and Graph Theory II
- MATH 635 Mathematical Modeling I
- & MATH 636 Mathematical Modeling II
- MATH 663 Theory of Probability I
- & MATH 664 Theory of Probability II
- MATH 667 Statistical Inference
- & MATH 668 Linear Statistical Modeling

Elective Courses $^{4,5}$ 24

Minimum Total Hours 30

4 All courses taken outside the Department of Mathematics must have prior departmental approval.
5 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Course List</td>
<td></td>
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</tbody>
</table>
- 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