Mathematics

http://www.math.illinois.edu

Interim Chair of the Department: Jeremy Tyson
Director of Graduate Studies: Lee DeVille
273 Altgeld Hall
1409 West Green Street
Urbana, IL 61801
(217) 333-5749
E-mail: math-grad@illinois.edu

Major: Applied Mathematics
Degrees Offered: M.S.
Graduate Concentration: Actuarial Science (in Applied Mathematics only)

Major: Mathematics
Degrees Offered: M.S., Ph.D.
Graduate Concentration: Actuarial Science and Risk Analytics (Ph.D. only)

Major: Teaching of Mathematics
Degrees Offered: M.S.

Graduate Degree Programs

The department offers graduate study leading to the Master of Science in Mathematics, the Doctor of Philosophy in Mathematics, the Master of Science in Applied Mathematics, and the Master of Science in the Teaching of Mathematics. Opportunity also exists for specializing in computational science and engineering within the department’s graduate programs via the Computational Science and Engineering (CSE) Concentration (http://cse.illinois.edu), and for specializing in financial mathematics via the Actuarial Science and Risk Analytics Concentration within the Mathematics Ph.D.

Admission

See the Mathematics Ph.D. information page (http://www.math.illinois.edu/GraduateProgram/apply-phd.html) or the Mathematics Masters information page (http://www.math.illinois.edu/GraduateProgram/apply-ms.html) for application deadlines, admission requirements including English requirements for non-native speakers, and for funding information.

The master’s degree programs can be completed in one-and-one-half years of full-time study by students entering without deficiencies.

- Master of Science in Applied Mathematics, Actuarial Science Concentration (http://catalog.illinois.edu/graduate/graduate-majors/math/ms-applied=math-conc-actuarial-science)
- Master of Science in Applied Mathematics, Applications to the Sciences option (http://catalog.illinois.edu/graduate/graduate-majors/math/ms-applied-math-apps-sciences)
- Master of Science in Applied Mathematics, Computational Science and Engineering option (http://catalog.illinois.edu/graduate/graduate-majors/math/ms-applied-math-science-applied-math-compute-science-eng)
- Master of Science in Applied Mathematics, Optimization and Algorithms option (http://catalog.illinois.edu/graduate/graduate-majors/math/ms-applied-math-optimiz-algo)
- Master of Science in Mathematics (http://catalog.illinois.edu/graduate/graduate-majors/math/ms-math)
- Master of Science in Teaching of Mathematics (http://catalog.illinois.edu/graduate/graduate-majors/math/ms-teaching-math)

Doctor of Philosophy in Mathematics

Students working toward a Ph.D. degree usually require four to six years to complete the requirements. Each student must pass the comprehensive examinations (testing the student’s knowledge of basic graduate-level mathematics in algebra, analysis, and other areas) and the preliminary examination (testing the student’s ability to begin or continue research in a chosen field). Students must also write and defend a research thesis in their field of mathematics.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Master’s equivalency</td>
<td>32</td>
</tr>
<tr>
<td>MATH 599</td>
<td>Thesis Research (0 min applied toward degree)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
<td>96</td>
</tr>
</tbody>
</table>

Students in the Actuarial Science and Risk Analytics concentration are not required to take MATH 500.

Other Requirements

- Master of Science in Applied Mathematics, Actuarial Science Concentration
- Master of Science in Applied Mathematics, Applications to the Sciences option
- Master of Science in Applied Mathematics, Computational Science and Engineering option
- Master of Science in Applied Mathematics, Optimization and Algorithms option
- Master of Science in Mathematics

- Doctor of Philosophy in Mathematics
  - Actuarial Science and Risk Analytics Concentration

Students working toward a Ph.D. degree usually require four to six years to complete the requirements. Each student must pass the comprehensive examinations (testing the student’s knowledge of basic graduate-level mathematics in algebra, analysis, and other areas) and the preliminary examination (testing the student’s ability to begin or continue research in a chosen field). Students must also write and defend a research thesis in their field of mathematics.

Information listed in this catalog is current as of 05/2018
Students must demonstrate competence in five core courses including the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 540</td>
<td>Real Analysis</td>
<td>4</td>
</tr>
<tr>
<td>MATH 561</td>
<td>Theory of Probability I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 563</td>
<td>Risk Modeling and Analysis</td>
<td>4</td>
</tr>
<tr>
<td>STAT 510</td>
<td>Mathematical Statistics I</td>
<td>4</td>
</tr>
</tbody>
</table>

Students must also demonstrate proficiency in undergraduate complex analysis.

Students must demonstrate competence in the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 564</td>
<td>Applied Stochastic Processes</td>
<td>4</td>
</tr>
<tr>
<td>STAT 425</td>
<td>Applied Regression and Design</td>
<td>3 or 4</td>
</tr>
<tr>
<td>FIN 591</td>
<td>Theory of Finance</td>
<td>4</td>
</tr>
</tbody>
</table>

Students must demonstrate competence in two of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASRM 575</td>
<td>Life Insurance and Pension Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>ASRM 510</td>
<td>Financial Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>ASRM 561</td>
<td>Loss Data Analytics &amp; Credibility</td>
<td>4</td>
</tr>
</tbody>
</table>

**Master’s equivalency**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 599</td>
<td>Thesis Research (0 min applied toward degree)</td>
<td>0</td>
</tr>
</tbody>
</table>

**Total Hours required for the degree**

96

**Other requirements**

Other requirements may overlap.

- MATH 405, MATH 406, MATH 415, MATH 444, and MATH 499 cannot be counted toward this graduate degree.

- 64 hours in residence

- Masters Degree Required for Admission to PhD: No
- Comprehensive Exam Required: Yes
- Preliminary Exam Required: Yes
- Final Exam/Dissertation Defense Required: Yes
- Dissertation Deposit Required: Yes
- Minimum GPA: 3.25

1 For additional details and requirements refer to the department’s Guide to Graduate Studies (http://www.math.illinois.edu/GraduateProgram) and the Graduate College Handbook (http://www.grad.illinois.edu/gradhandbook).