# 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.

<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**

32

**MATH 599** Thesis Research (0 min applied toward degree) 0

**Total Hours required for the degree** 96

## Other requirements

Other requirements may overlap.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 405, MATH 406, MATH 415, MATH 444, and MATH 499 cannot be counted toward this graduate degree.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 |

Information listed in this catalog is current as of 04/2019