APPLIED MATHEMATICS, MS

for the Master of Science in Applied Mathematics

Students pursuing the M.S. in Applied Mathematics have the opportunity to customize their studies the following ways:

- Through the Computational Science and Engineering Concentration. ([http://catalog.illinois.edu/graduate/engineering/concentration/computational-science-engineering/](http://catalog.illinois.edu/graduate/engineering/concentration/computational-science-engineering/))
- By completing the coursework for the option in Optimization and Algorithms;
- By completing the coursework for the option in Applications to the Sciences;
- By completing the coursework for the option in Computational Science and Engineering.

For additional details and requirements refer to the Department of Mathematics Graduate Guide ([https://files.webservices.illinois.edu/7917/GraduateGuide18-19.pdf](https://files.webservices.illinois.edu/7917/GraduateGuide18-19.pdf)) and the Graduate College Handbook ([http://www.grad.illinois.edu/gradhandbook/](http://www.grad.illinois.edu/gradhandbook/)).

### Thesis Option

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 599</td>
<td>Thesis Research</td>
<td>4</td>
</tr>
</tbody>
</table>

Choose one of these three (3) options:

**Optimization and Algorithms Option**

Courses from at least three (3) of the following areas: Optimization, Control Theory and Coding Theory, Combinatorics and Graph Theory, Algorithms and Theory of Computation, Statistics (including core courses listed below)

Select four (4) of the following: 12-16

- MATH 412 | Graph Theory
- MATH 413 | Intro to Combinatorics
- MATH/CS 450 | Numerical Analysis
- MATH/CS 473 | Algorithms
- ASRM 450/STAT 420 | Methods of Applied Statistics
- MATH 482 | Linear Programming
- MATH 484 | Nonlinear Programming

**Applications to the Sciences Option**

Select three (3) of the following: 9-16

- MATH 489 | Dynamics & Differential Eqns
- MATH 550 | Dynamical Systems I
- MATH 553 | Partial Differential Equations
- MATH 558 | Methods of Applied Mathematics

Credit hours in a department other than Mathematics, providing substantive applications of differential equations and applied mathematics. 8

**Computational Science and Engineering Option**

MATH 550 | Dynamical Systems I 4

or

MATH 553 | Partial Differential Equations

Choose one (1) advanced course in Algebra or Analysis: 3-4

- MATH 418 | Intro to Abstract Algebra II
- MATH 448 | Complex Variables
- MATH 540 | Real Analysis
- MATH 542 | Complex Variables I

12 hours from CSE courses (at least 4 in MATH, 4 not in MATH) 12

**Total Hours** 32
Other Requirements

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>MATH 405, MATH 406, MATH 415, MATH 444, and MATH 499</td>
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<td></td>
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<td></td>
<td>cannot be counted toward this graduate degree.</td>
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Minimum hours required within the unit: 20
Minimum 500-level hours required overall: 12 (8 in Mathematics)
Minimum GPA: 3.0
Total Hours (graduate study): 32

Non-Thesis Option

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For all options:
Coursework to total 32 hours in MATH or ASRM (in consultation with advisor).

Choose one of these three (3) options:

Optimization and Algorithms Option
Courses from at least three (3) of the following areas: Optimization, Control Theory and Coding Theory, Combinatorics and
Graph Theory, Algorithms and Theory of Computation, Statistics (including core courses listed below)
Select four (4) of the following: 12-16

- MATH 412 Graph Theory
- MATH 413 Intro to Combinatorics
- MATH/CS 450 Numerical Analysis
- MATH/CS 473 Algorithms
- ASRM 450/STAT 420 Methods of Applied Statistics
- MATH 482 Linear Programming
- MATH 484 Nonlinear Programming

Applications to the Sciences Option
Select three (3) of the following: 9-16

- MATH 489 Dynamics & Differential Eqns
- MATH 550 Dynamical Systems I
- MATH 553 Partial Differential Equations
- MATH 558 Methods of Applied Mathematics

Credit hours in a department other than Mathematics, providing substantive applications of differential equations and applied
mathematics: 8

Computational Science and Engineering Option

MATH 550 Dynamical Systems I 4
or MATH 553 Partial Differential Equations

Choose one (1) advanced course in Algebra or Analysis: 3-4

- MATH 418 Intro to Abstract Algebra II
- MATH 448 Complex Variables
- MATH 540 Real Analysis
- MATH 542 Complex Variables I

12 hours from CSE courses (at least 4 in MATH, 4 not in MATH): 12
Total Hours: 32

Other Requirements

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Minimum hours required within the unit: 20
Minimum 500-level hours required overall: 12 (8 in Mathematics)
Minimum GPA: 3.0
Total Hours (graduate study): 32

Information listed in this catalog is current as of 05/2022