

M.S. in Applied Mathematics

Degree Requirements

Students with a baccalaureate degree in an area different from mathematics may be admitted and required by the department to take an individually-designed program of bridge courses that may include undergraduate courses before proceeding to the graduate curriculum. Such courses do not count towards a graduate degree.

The Master of Science in Applied Mathematics requires 30 credits: 15 credits in core courses, 15 credits in an area of specialization, of which six credits are required and nine credits are electives. Students must successfully complete at least 24 of these credits at the 600-level or higher, and no more than six credits at the 500-level will be counted towards the degree. Specific course requirements depend on the area of specialization. A master's thesis or a master's project is optional. (Advisor's permission is required)

Seminar: In addition to the minimum 30 degree credits required, all students who receive departmental or research-based awards must enroll every semester in MATH 791 Graduate Seminar.

M.S. in Applied Mathematics (courses only)

Core Courses

| | | |
|----------|--|---|
| MATH 613 | Advanced Applied Mathematics I: Modeling | 3 |
| MATH 631 | Linear Algebra | 3 |
| MATH 645 | Analysis I ¹ | 3 |
| MATH 656 | Complex Variables I | 3 |
| MATH 689 | Advanced Applied Mathematics II: Ordinary Differential Equations | 3 |

Required Courses in Areas of Specialization

Select one of the following Areas of Specialization: 6

Analysis

| | |
|----------|----------------------|
| MATH 745 | Analysis II |
| MATH 756 | Complex Variables II |

Applied Mathematics

| | |
|----------|--|
| MATH 614 | Numerical Methods I |
| MATH 690 | Advanced Applied Mathematics III: Partial Differential Equations |

Computational Mathematics

| | |
|----------|----------------------|
| MATH 614 | Numerical Methods I |
| MATH 712 | Numerical Methods II |

Mathematical Biology

| | |
|----------|---------------------------------------|
| MATH 635 | Analytical Computational Neuroscience |
| MATH 637 | Foundations of Mathematical Biology |

Electives

Select three courses with approval of graduate advisor 9

Total Credits 30

¹ Students specializing in Applied Mathematics or Computational Mathematics may take MATH 545 Introductory Mathematical Analysis and MATH 546 Advanced Calculus, instead of MATH 645 Analysis I and 3 credits of elective.

M.S. in Applied Mathematics (Master's project)

Core Courses

| | | |
|----------|--|---|
| MATH 613 | Advanced Applied Mathematics I: Modeling | 3 |
| MATH 631 | Linear Algebra | 3 |
| MATH 645 | Analysis I ¹ | 3 |
| MATH 656 | Complex Variables I | 3 |
| MATH 689 | Advanced Applied Mathematics II: Ordinary Differential Equations | 3 |

Project

| | | |
|----------|------------------|---|
| MATH 700 | Master's Project | 3 |
|----------|------------------|---|

Required Courses in Areas of Specialization

| | |
|---|--|
| Select one of the following Areas of Specialization: | 6 |
| Analysis | |
| MATH 745 | Analysis II |
| MATH 756 | Complex Variables II |
| Applied Mathematics | |
| MATH 614 | Numerical Methods I |
| MATH 690 | Advanced Applied Mathematics III: Partial Differential Equations |
| Computational Mathematics | |
| MATH 614 | Numerical Methods I |
| MATH 712 | Numerical Methods II |
| Mathematical Biology | |
| MATH 635 | Analytical Computational Neuroscience |
| MATH 637 | Foundations of Mathematical Biology |
| Electives | |
| Select three courses with approval of graduate advisor. | 9 |
| Total Credits | 33 |

¹ Students specializing in Applied Mathematics or Computational Mathematics may take MATH 545 Introductory Mathematical Analysis and MATH 546 Advanced Calculus, instead of MATH 645 Analysis I and 3 credits of elective.

M.S. in Applied Mathematics (Master's thesis)

Core Courses

| | | |
|----------|--|---|
| MATH 613 | Advanced Applied Mathematics I: Modeling | 3 |
| MATH 631 | Linear Algebra | 3 |
| MATH 645 | Analysis I ¹ | 3 |
| MATH 656 | Complex Variables I | 3 |
| MATH 689 | Advanced Applied Mathematics II: Ordinary Differential Equations | 3 |

Thesis

| | | |
|----------|-----------------|---|
| MATH 701 | Master's Thesis | 6 |
|----------|-----------------|---|

Required Courses in Areas of Specialization

| | |
|---|--|
| Select one of the following Areas of Specialization: | 6 |
| Analysis | |
| MATH 745 | Analysis II |
| MATH 756 | Complex Variables II |
| Applied Mathematics | |
| MATH 614 | Numerical Methods I |
| MATH 690 | Advanced Applied Mathematics III: Partial Differential Equations |
| Computational Mathematics | |
| MATH 614 | Numerical Methods I |
| MATH 712 | Numerical Methods II |
| Mathematical Biology | |
| MATH 635 | Analytical Computational Neuroscience |
| MATH 637 | Foundations of Mathematical Biology |
| Electives | |
| Select three courses with approval of graduate advisor. | 9 |
| Total Credits | 36 |

¹ Students specializing in Applied Mathematics or Computational Mathematics may take MATH 545 Introductory Mathematical Analysis and MATH 546 Advanced Calculus, instead of MATH 645 Analysis I and 3 credits of elective.

Electives are chosen in consultation with a Departmental Graduate Advisor and consist of advanced courses in mathematics and advanced courses from biology, physics, computer science, and engineering, for example. Courses offered by appropriate departments at NJIT, RBHS, and Rutgers-Newark can be used as electives within the limits of the NJIT transfer policy. All elective courses must be approved by the graduate advisor.