

# M.S. in Mathematical and Computational Finance

## Degree Requirements

### Master of Science in Mathematical and Computational Finance

The Master of Science in Mathematical and Computational Finance requires 33 credits: 27 credits in core courses, 3 credits in an approved elective, and 3 credits in a project course.

| Semester I            |   | Term Credits |
|-----------------------|---|--------------|
| FIN 641               | Derivatives Markets                                 | 3            |
| MATH 605              | Stochastic Calculus                                 | 3            |
| MATH 611              | Numerical Methods for Computation                   | 3            |
| MATH 646              | Time Series Analysis                                | 3            |
| <b>Term Credits</b>   |   | <b>12</b>    |
| Semester II           |   | Term Credits |
| MATH 604              | Mathematical Finance                                | 3            |
| MATH 606              | Term Structure Models                               | 3            |
| MATH 608              | Partial Differential Equations for Finance          | 3            |
| CS 666<br>or MATH 666 | Simulation for Finance<br>or Simulation for Finance | 3            |
| <b>Term Credits</b>   |   | <b>12</b>    |
| Semester III          |   | Term Credits |
| MATH 607              | Credit Risk Models                                  | 3            |
| Approved Elective     |   | 3            |
| MATH 609              | Projects in Mathematical and Computational Finance  | 3            |
| <b>Term Credits</b>   |   | <b>9</b>     |
| <b>Total Credits</b>  |   | <b>33</b>    |

For students having already successfully completed the equivalent of a course required for the program, more advanced courses can be substituted with departmental approval.

## Electives

|          |  |   |
|----------|--|---|
| CS 505   | Programming, Data Structures, and Algorithms | 3 |
| CS 602   | Java Programming                             | 3 |
| CS 610   | Data Structures and Algorithms               | 3 |
| CS 611   | Introduction to Computability and Complexity | 3 |
| CS 631   | Data Management System Design                | 3 |
| CS 632   | Advanced Database System Design              | 3 |
| CS 634   | Data Mining                                  | 3 |
| CS 675   | Machine Learning                             | 3 |
| EM 602   | Management Science                           | 3 |
| FIN 624  | Corporate Finance II                         | 3 |
| FIN 626  | Financial Investment Institutions            | 3 |
| FIN 650  | Investment Analysis and Portfolio Theory     | 3 |
| MATH 644 | Regression Analysis Methods                  | 3 |
| MATH 647 | Time Series Analysis II                      | 3 |
| MATH 659 | Survival Analysis                            | 3 |
| MATH 662 | Probability Distributions                    | 3 |
| MATH 665 | Statistical Inference                        | 3 |
| MATH 691 | Stochastic Processes with Applications       | 3 |
| MATH 699 | Design and Analysis of Experiments           | 3 |
| MATH 712 | Numerical Methods II                         | 3 |

MATH 763

Generalized Linear Models

3

Electives are chosen in consultation with the Program Director and consist of advanced courses in mathematics, statistics, probability, computer science, and management (The list above is a partial list of available courses).

### Master of Science in Mathematical and Computational Finance - Applied Quantitative Finance Option

(this option does not have electives)

| <b>Semester I</b>     |   | <b>Term Credits</b> |
|-----------------------|---|---------------------|
| FIN 641               | Derivatives Markets                                 | 3                   |
| MATH 605              | Stochastic Calculus                                 | 3                   |
| MATH 611              | Numerical Methods for Computation                   | 3                   |
| PTC 601               | Advanced Professional and Technical Communication   | 3                   |
| <b>Term Credits</b>   |   | <b>12</b>           |
| <b>Semester II</b>    |   |                     |
| MATH 604              | Mathematical Finance                                | 3                   |
| MATH 606              | Term Structure Models                               | 3                   |
| MATH 608              | Partial Differential Equations for Finance          | 3                   |
| MATH 666<br>or CS 666 | Simulation for Finance<br>or Simulation for Finance | 3                   |
| <b>Term Credits</b>   |   | <b>12</b>           |
| <b>Semester III</b>   |   |                     |
| MATH 607              | Credit Risk Models                                  | 3                   |
| MATH 609              | Projects in Mathematical and Computational Finance  | 3                   |
| MGMT 641              | Global Project Management                           | 3                   |
| <b>Term Credits</b>   |   | <b>9</b>            |
| <b>Total Credits</b>  |   | <b>33</b>           |