

## Degree Plans for Master of Science (MS) in Mathematics

The Master of Science (MS) in Mathematics program is designed to provide a graduate level education for students who intend to teach at various levels, students who will continue or seek employment within the industrial sector, and students who intend to continue their education beyond the master's level at other institutions. \*This program has the option to be completed fully online.

The Master of Science in Mathematics has four tracks, a Mathematics Concentration, Applied Mathematics Concentration, Mathematics Teaching Concentration, and a Statistics Concentration. In each case, the student can choose from a Thesis, Project, or Comprehensive Exam exit option.

Mathematicians with a strong background in pure mathematics are attractive to employers in many professional branches of society, particularly intelligence technology, finance, security, engineering and physics. Industrial mathematics is a growing branch of mathematics that requires trained personnel for key positions in modern industries. A specialization in mathematics teaching offers an opportunity to become an effective mathematics instructor with technology skills especially for online or distance education.

### Degree Requirements

Graduate students may be required to take undergraduate courses in mathematics to make up for deficiencies in preparation as determined by their temporary Admission or Advising Committee. These courses will not be applied to the degree program.

Graduate students for all concentrations must take the following three common core courses:

|                           |          |
|---------------------------|----------|
| <b>Required Courses</b>   | <b>9</b> |
| MATH 6330: Linear Algebra | 3        |
| MATH 6331: Algebra I      | 3        |
| MATH 6352: Analysis I     | 3        |

Choose one of the following four concentrations: Mathematics Concentration, Applied Mathematics Concentration, Mathematics Teaching Concentration, and Statistics Concentration.

### Mathematics Concentration

|                         |          |
|-------------------------|----------|
| <b>Required Courses</b> | <b>6</b> |
| MATH 6332: Algebra II   | 3        |
| MATH 6353: Analysis II  | 3        |

|                             |          |
|-----------------------------|----------|
| <b>Designated Electives</b> | <b>9</b> |
|-----------------------------|----------|

Chosen from the following:

|                                            |   |
|--------------------------------------------|---|
| MATH 6323: Group Theory                    | 3 |
| MATH 6329: Number Theory                   | 3 |
| MATH 6339: Complex Analysis                | 3 |
| MATH 6360: Ordinary Differential Equations | 3 |
| MATH 6365: Probability and Statistics      | 3 |
| MATH 6367: Functional Analysis             | 3 |
| MATH 6368: Operator Theory                 | 3 |
| MATH 6370: Topology                        | 3 |

|                                  |   |
|----------------------------------|---|
| MATH 6371: Differential Geometry | 3 |
| MATH 6373: Algebraic Geometry    | 3 |
| MATH 6388: Discrete Mathematics  | 3 |

**Free Electives** **6**

Chosen from any 6000-level mathematics-related courses approved by the concentration and/or thesis advisor.

**Capstone Requirement** **6**

Choose one of the following capstone options:

|                      |   |
|----------------------|---|
| Thesis               |   |
| MATH 7300: Thesis I  | 3 |
| MATH 7301: Thesis II | 3 |

OR

|                                            |   |
|--------------------------------------------|---|
| Project                                    |   |
| MATH 6391: Master's Project                | 3 |
| Additional 3 hours of designated electives | 3 |

OR

|                                            |   |
|--------------------------------------------|---|
| Non-Thesis                                 |   |
| Additional 6 hours of designated electives | 6 |
| Written and/or Oral Comprehensive Exam     |   |

Total graduate hours for degree: 36

## Applied Mathematics Concentration

**Required Courses** **9**

|                                            |   |
|--------------------------------------------|---|
| MATH 6360: Ordinary Differential Equations | 3 |
| MATH 6361: Partial Differential Equations  | 3 |
| MATH 6375: Numerical Analysis              | 3 |

**Designated Electives** **6**

Chosen from the following:

|                                                                    |   |
|--------------------------------------------------------------------|---|
| MATH 6353: Analysis II                                             | 3 |
| MATH 6362: Fourier Analysis                                        | 3 |
| MATH 6363: Integrable Systems                                      | 3 |
| MATH 6365: Probability and Statistics                              | 3 |
| MATH 6366: Micro-local Analysis                                    | 3 |
| MATH 6367: Functional Analysis                                     | 3 |
| MATH 6369: Mathematical Methods                                    | 3 |
| MATH 6371: Differential Geometry                                   | 3 |
| MATH 6376: Numerical Methods<br>for Partial Differential Equations | 3 |
| MATH 6377: Mathematical Fluid Mechanics                            | 3 |
| MATH 6378 Inverse Problem                                          |   |

|                                 |   |
|---------------------------------|---|
| and Image Reconstruction        | 3 |
| MATH 6379 Stochastic Processes  | 3 |
| MATH 6387 Mathematical Modeling | 3 |

**Free Electives** **6**

Chosen from any 6000-level mathematics-related courses approved by the concentration and/or thesis advisor

**Capstone Requirement** **6**

|                      |   |
|----------------------|---|
| Thesis               |   |
| MATH 7300: Thesis I  | 3 |
| MATH 7301: Thesis II | 3 |

OR

|                                            |   |
|--------------------------------------------|---|
| Project                                    | 6 |
| MATH 6391: Master's Project                | 3 |
| Additional 3 hours of designated electives | 3 |

OR

|                                            |   |
|--------------------------------------------|---|
| Non-Thesis                                 |   |
| Additional 6 hours of designated electives | 6 |
| Written and/or Oral Comprehensive Exam     |   |

Total graduate hours for degree: 36

## Mathematics Teaching Concentration

**Required Courses** **6**

|                                                            |   |
|------------------------------------------------------------|---|
| MATE/MATH 6310: Mathematics Teaching and Learning Theories | 3 |
| MATE 6359: Mathematics Education Research Design           | 3 |

**Designated Electives** **9**

Chosen from the following:

|                                                       |   |
|-------------------------------------------------------|---|
| MATH 5390 Survey of Topics in Mathematics             | 3 |
| MATH 6305 History of Mathematics                      | 3 |
| MATE 6307: Collegiate Mathematics Teaching            | 3 |
| MATH 6325 Contemporary Geometry                       | 3 |
| MATE/MATH 6328 Special Topics in Mathematics Teaching | 3 |
| MATH 6329 Number Theory                               | 3 |
| MATH 6360 Ordinary Differential Equations             | 3 |
| MATH 6364 Statistical Methods                         | 3 |
| MATH 6365 Probability and Statistics                  | 3 |
| MATH 6387 Mathematical Modeling                       | 3 |
| MATH 6388 Discrete Mathematics                        | 3 |

**Free Electives** **6**

Chosen from any 6000-level mathematics-related courses approved by the concentration and/or thesis advisor

**Capstone Requirement 6**

Thesis  
MATH 7300: Thesis I 3  
MATH 7301: Thesis II 3

OR

Project 6  
MATH 6391: Master's Project 3  
Additional 3 hours of designated electives 3

OR

Non-Thesis  
Additional 6 hours of designated electives 6  
Written and/or Oral Comprehensive Exam

Total graduate hours for degree: 36

**Statistics Concentration**

**Required Courses 9**

MATH 6364: Statistical Methods 3  
MATH 6365: Probability and Statistics 3  
MATH 6375: Numerical Analysis 3

**Designated Electives 6**

Chosen from the following:

MATH 6336 Advanced Sampling 3  
MATH 6353 Analysis II 3  
MATH 6360 Ordinary Differential Equations 3  
MATH 6379 Stochastic Processes 3  
MATH 6380 Time Series Analysis 3  
MATH 6381 Mathematical Statistics 3  
MATH 6382 Statistical Computing 3  
MATH 6383 Experimental Design and Categorical Data 3  
MATH 6384 Biostatistics 3  
MATH 6386 Statistical Data Mining 3  
MATH 6387 Mathematical Modeling 3  
MATH 6389 Actuarial Statistics 3

**Free Electives 6**

Chosen from any 6000-level mathematics-related courses approved by the concentration and/or thesis advisor

**Capstone Requirement** **6**

Thesis  
MATH 7300: Thesis I 3  
MATH 7301: Thesis II 3

OR

Project 6  
MATH 6391: Master's Project 3  
Additional 3 hours of designated electives 3

OR

Non-Thesis  
Additional 6 hours of designated electives 6  
Written and/or Oral Comprehensive Exam

Total graduate hours for degree: 36

This program will not prepare the students for any license or certification.