

# Advanced Mathematics Certificate

More advanced mathematical understanding and sophistication enhance nearly every technical degree. This certificate will allow students from a broad range of disciplines to receive formal recognition for obtaining additional skills, training, and knowledge in advanced mathematics.

**Total Hours Required: 18**

## Requirements

Requirements are listed in the table below. Additional requirements may follow the table, so be sure to read the entire page. Some required courses listed below may also satisfy [General Education](#) requirements, including [Core Curriculum](#). Students should also review the [University's Undergraduate Minor and Certificate Requirements and Policies](#).

| Code                                                                   | Title                                             | Hours |
|------------------------------------------------------------------------|---------------------------------------------------|-------|
| <b>Foundational Coursework</b>                                         |                                                   |       |
| Hours chosen from: IBL coursework as designated in the Course Schedule |                                                   | 3     |
| M 325K                                                                 | Discrete Mathematics (must be IBL or II)          |       |
| M 328K                                                                 | Introduction to Number Theory (must be IBL or II) |       |
| M 333L                                                                 | Structure of Modern Geometry (must be IBL or II)  |       |
| Hours chosen from:                                                     |                                                   | 3     |
| M 340L                                                                 | Matrices and Matrix Calculations                  |       |
| M 341                                                                  | Linear Algebra and Matrix Theory                  |       |
| M 343K                                                                 | Introduction to Algebraic Structures              |       |
| M 361K                                                                 | Introduction to Real Analysis                     |       |
| M 365C                                                                 | Real Analysis I                                   |       |
| M 373K                                                                 | Algebraic Structures I                            |       |
| <b>Supplementary Coursework</b>                                        |                                                   |       |
| Hours chosen from:                                                     |                                                   | 6     |
| M 365D                                                                 | Real Analysis II                                  |       |
| M 367K                                                                 | Topology I                                        |       |
| M 367L                                                                 | Topology II                                       |       |
| M 362M                                                                 | Introduction to Stochastic Processes              |       |
| M 373L                                                                 | Algebraic Structures II                           |       |
| M 378K                                                                 | Introduction to Mathematical Statistics           |       |
| Hours chosen from:                                                     |                                                   | 6     |
| M 343K                                                                 | Introduction to Algebraic Structures              |       |
| M 343L                                                                 | Applied Number Theory                             |       |
| M 346                                                                  | Applied Linear Algebra                            |       |
| M 348                                                                  | Scientific Computation in Numerical Analysis      |       |
| M 358K                                                                 | Applied Statistics                                |       |
| M 361                                                                  | Theory of Functions of a Complex Variable         |       |
| M 361K                                                                 | Introduction to Real Analysis                     |       |
| M 362M                                                                 | Introduction to Stochastic Processes              |       |
| M 365C                                                                 | Real Analysis I                                   |       |
| M 365D                                                                 | Real Analysis II                                  |       |
| M 367K                                                                 | Topology I                                        |       |
| M 367L                                                                 | Topology II                                       |       |
| M 368K                                                                 | Numerical Methods for Applications                |       |
| M 372K                                                                 | Partial Differential Equations and Applications   |       |
| M 373K                                                                 | Algebraic Structures I                            |       |
| M 373L                                                                 | Algebraic Structures II                           |       |

|        |                                                             |
|--------|-------------------------------------------------------------|
| M 378K | Introduction to Mathematical Statistics                     |
| M 374M | Mathematical Modeling in Science and Engineering            |
| M 378N | Generalized Linear Models                                   |
| M 339D | Introduction to Financial Mathematics for Actuaries         |
| M 339G | Predictive Analytics                                        |
| M 339J | Probability Models with Actuarial Applications              |
| M 339U | Actuarial Contingent Payments I                             |
| M 339V | Actuarial Contingent Payments II                            |
| M 349P | Actuarial Statistical Estimates                             |
| M 349R | Applied Regression and Time Series                          |
| M 378P | Decision Analytics                                          |
| M 375D | Discovery: An Introduction to Advanced Study in Mathematics |

## College Requirements - Natural Sciences

### Undergraduate Minor and Certificate Requirements and Policies

**Total Hours** **18**

## Additional Requirements and Policy

- The certificate program a grade of at least a C- in each course.
- Courses that appear in multiple approved course lists may be used to satisfy only one requirement.
- No credit-by-exam may be used to fulfill certificate course requirements.
- With the approval of the certificate program faculty, other appropriate courses may be counted toward the certificate requirements.