

# MATHEMATICS, B.A.

## Program Learning Outcomes

*Graduates of the program will be able to:*

- demonstrate facility with analytical and algebraic concepts.
- write proofs.
- apply their mathematical knowledge and critical thinking to solve problems.
- use technology to solve problems.
- speak about their work with precision, clarity, and organization.
- write about their work with precision, clarity, and organization.
- identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand.
- collaborate effectively in teams.
- understand and create arguments supported by quantitative evidence.
- understand the professional, ethical, and social issues and responsibilities with the implementation and use of mathematical models and technology.

| Code                                                               | Title                                                                                 | Units |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------|
| <b>Lower-Division Requirements</b>                                 |                                                                                       |       |
| CSC 1043 and CSC 1043L                                             | Introduction to Computer Programming and Introduction to Computer Programming Lab     | 3     |
| CSC 1054 and CSC 1054L                                             | Objects and Elementary Data Structures and Objects and Elementary Data Structures Lab | 4     |
| MTH 1064 and MTH 1064L                                             | Calculus I (FE) and Calculus I Lab (FE)                                               | 4     |
| MTH 1074 and MTH 1074L                                             | Calculus II and Calculus II Lab                                                       | 4     |
| MTH 2033                                                           | Linear Algebra                                                                        | 3     |
| MTH 2074                                                           | Calculus III                                                                          | 4     |
| <b>Upper-Division Requirements</b>                                 |                                                                                       |       |
| MTH 3012                                                           | Number Theory with Proofs                                                             | 2     |
| MTH 3052                                                           | History of Mathematics                                                                | 2     |
| MTH 3083                                                           | Mathematical Probability and Statistics                                               | 3     |
| MTH 4081                                                           | Senior Seminar in Computer Science                                                    | 1     |
| MTH 4024                                                           | Real Analysis                                                                         | 4     |
| or MTH 4044                                                        | Abstract Algebra                                                                      |       |
| Choose one (1) course from the following:                          |                                                                                       | 3     |
| MTH 3033                                                           | Differential Equations                                                                |       |
| MTH 3043                                                           | Discrete Mathematics                                                                  |       |
| MTH 3073                                                           | Mathematical Modeling                                                                 |       |
| MTH 4013                                                           | Complex Analysis                                                                      |       |
| Choose one (1) sequence from the following:                        |                                                                                       | 3     |
| HON 4098 and HON 4099                                              | Honors Project I and Honors Project II                                                |       |
| MTH 4102 and MTH 4121                                              | Independent Research in Mathematics I and Independent Research in Mathematics II      |       |
| MTH 4133                                                           | Service Learning in Mathematics                                                       |       |
| <b>Elective Courses</b>                                            |                                                                                       |       |
| Choose eight (8) additional units from the following: <sup>1</sup> |                                                                                       | 8     |
| CSC 3011                                                           | Machine Learning and Multivariate Modeling in R                                       |       |

|          |                                             |
|----------|---------------------------------------------|
| CSC 3021 | Computational Tools                         |
| CSC 3031 | Data Visualization and Communication with R |
| HON 4098 | Honors Project I                            |
| HON 4099 | Honors Project II                           |
| MTH 3033 | Differential Equations                      |
| MTH 3043 | Discrete Mathematics                        |
| MTH 3073 | Mathematical Modeling                       |
| MTH 4002 | Topics in Geometry                          |
| MTH 4013 | Complex Analysis                            |
| MTH 4024 | Real Analysis                               |
| MTH 4044 | Abstract Algebra                            |
| MTH 4053 | Advanced Applied Statistics                 |
| MTH 4062 | Research in Data Science                    |
| MTH 4071 | History of Mathematics Study Tour           |
| MTH 4072 | Internship in Data Science                  |
| MTH 4091 | Independent Study in Mathematics            |
| MTH 4092 | Special Topics in Mathematics               |
| MTH 4102 | Independent Research in Mathematics I       |
| MTH 4121 | Independent Research in Mathematics II      |
| MTH 4133 | Service Learning in Mathematics             |

**Total Units** **48**

<sup>1</sup> An elective course may not count as both an upper-division requirement and a required "additional elective."

**Total Non-FE Units for Degree: 44**