

# 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 3003   | Python and UNIX   |       |

|          |   |
|----------|---|
| 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 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                 |
| MTH 4162 | Project for Data Analytics Minors I             |
| MTH 4171 | Project for Data Analytics Minors II            |

**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**