

## Requirements for B.S. in Mathematics

### Core courses (16/19):

MATH 1550/1551 Differential Calc (3/2)

MATH 1552 Integral Calculus (4)

MATH 2551/2561 Multivariable Calculus (4)

MATH 2552/2562 Differential Equations (4)

Plus one course from the following list:

MATH 1553 Introduction to Linear Algebra (2)

MATH 1554 Linear Algebra (4)

MATH 1564 Linear Algebra with Abstract Vector Spaces (4)

### Bridging courses (12):

MATH 2106 Foundations Of Mathematical Proof (3)

MATH 3012 Applied Combinatorics (3)

MATH 3235 Probability Theory (3)

MATH 3406 A Second Course in Linear Algebra (3)

**Upper level foundation courses** ((I)Core upper level (9) + (II)List A (12) + (III)List A or B (9) = 21):

### (I) Core upper level (9):

MATH 4107 Abstract Algebra I (3)

MATH 4317 Analysis I (3)

MATH 4320 Complex Analysis (3)

### (II) Four courses from List A (12):

### (III) Nine hours from List A or List B that were not used above (9)

must be different from the courses used to satisfy the (II) requirements

#### List A

MATH 3236 Statistical Theory (3)

MATH 4022 Intro to Graph Theory (3)

MATH 4032 Combinatorial Analysis (3)

MATH 4108 Abstract Algebra II (3)

MATH 4150 Intro to Number Theory (3)

MATH 4221 Stochastic Processes I (3)

MATH 4261 Mathematical Statistics I (3)

MATH 4318 Real Analysis II (3)

MATH 4347 Partial Differential Equations I (3)

MATH 4431 Introduction to Topology (3)

MATH 4432 Introduction to Algebraic Topology (3)

MATH 4441 Differential Geometry (3)

MATH 4541 Dynamics and Bifurcations I (3)

MATH 4640 Numerical Analysis I (3)

#### List B

Nine credit hours chosen from the above list or the list below (must be different from the courses used to satisfy the above requirements):

MATH 4080/4090 Senior Project (2)  
MATH 4222 Stochastic Processes II (3)  
MATH 4255 Monte Carlo Techniques (3)  
MATH 4262 Mathematical Statistics II (3)  
MATH 4280 Introduction to Information Theory (3)  
MATH 4348 Partial Differential Equations II (3)  
MATH 4542 Dynamics and Bifurcations II (3)  
MATH 4580 Linear Programming (3)  
MATH 4581 Classical Mathematical Methods in Engineering (3)  
MATH 4641 Numerical Analysis II (3)  
MATH 4699 Undergraduate Research (1/6)MATH 4755 Mathematical Biology (3)  
MATH 4777 Scientific Computing (3)  
MATH 4782 Quantum Information and Quantum Computing (3)  
MATH 4801 Undergraduate Seminar (1)  
MATH 4802 Mathematical Problem Solving (2)  
CS 3510/3511 Design and Analysis of Algorithms I (3)  
CS 4510 Automata and Complexity (3)  
CS 4540 Advanced Algorithms (3)  
CS 4641 Machine Learning (3)  
CX 4140 Computational Modeling Algorithms (3)  
CX 4240 Computational Data Analysis (3)  
ISYE 3133/3833 Engineering Optimization (3)  
ISyE 4133 Advanced Optimization (3)

**Supporting courses (18):**

CS 1301 Intro to Computing (3)  
CS 1331 Intro to Object Oriented Programming (3)  
Lab Sci (BIOL, CHEM, EAS) (4)  
PHYS 2211/2231 Physics I (4)  
PHYS 2212/2232 Physics II (4)

**Sci/Eng Electives (9):**

Three upper level courses from an approved school, at least two of which must be from the same school. (Approved schools: BIOL, CHEM, EAS, PHYS, PSYC, ECON, CS, AE, BMED, CEE, CHBE, ECE, ISYE, MSE, ME). The courses CEE 3770, ISYE 3770, CS 4001 and CS 4002 can be used to satisfy this requirement.

**Humanities (12):**

ENGL 1101 (3)  
ENGL 1102 (3)  
Humanities/Fine Arts Elective (6):  
Approved HUM courses, such as Literature,  
Phil, Foreign Language, etc.

**Social Sciences (12):**

One of HIST 2111, HIST 2112, POL 1101,INTA 1200, PUBP 3000 (3)  
Social Science Electives (9): approved SS courses, such as Economics, Psychology, History, etc.  
Wellness (2): APPS 1040 or 1050

**Free Electives (11)**

**Total: 122 hours**