# Applied Mathematics Concentration

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 304</td>
<td>Vector Analysis</td>
<td>4</td>
</tr>
<tr>
<td>MATH 344</td>
<td>Linear Analysis II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 350</td>
<td>Mathematical Software</td>
<td>4</td>
</tr>
<tr>
<td>or CSC/CPE 202</td>
<td>Data Structures</td>
<td></td>
</tr>
<tr>
<td>MATH 408</td>
<td>Complex Analysis I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 413</td>
<td>Introduction to Analysis II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 416</td>
<td>Differential Equations I</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 418</td>
<td>Partial Differential Equations</td>
<td></td>
</tr>
<tr>
<td>MATH 451</td>
<td>Numerical Analysis I</td>
<td>4</td>
</tr>
<tr>
<td>STAT 301</td>
<td>Statistics I</td>
<td>4</td>
</tr>
<tr>
<td>or STAT 305</td>
<td>Introduction to Probability and Simulation</td>
<td></td>
</tr>
<tr>
<td>or STAT 425</td>
<td>Probability Theory</td>
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</tbody>
</table>

## Tracks

Select courses from one of the following tracks.\(^1,2\) 12

### Track A

- MATH 335  Graph Theory
- MATH 406  Linear Algebra III
- MATH 409  Complex Analysis II
- MATH 414  Introduction to Analysis III
- MATH 416  Differential Equations II
- MATH 418  Partial Differential Equations
- MATH 437  Game Theory
- MATH 451  Numerical Analysis II
- MATH 453  Numerical Optimization
- MATH 460  Senior Project Applied Seminar
- MATH 461  Senior Project I
- & MATH 462  Senior Project II
- MATH 476  Advanced Topics in Applied Mathematics

### Track B

- DATA 301  Introduction to Data Science
- DATA 401  Data Science
- MATH 335  Graph Theory
- or MATH 453  Numerical Optimization

## Approved Electives\(^3\)

Select three courses in one of the following categories, with at least one course at the 300 level or above.\(^4\) 12

### Physics Category:

- ASTR 301  Planetary Systems
- ASTR 302  Stars and Galaxies
- ASTR 326  Cosmology
- PHYS 132  General Physics II
- or PHYS 133  General Physics III
- PHYS 211  Modern Physics I
- PHYS 301  Thermal Physics I
- PHYS 302  Classical Mechanics I
- PHYS 303  Classical Mechanics II
- PHYS 318  Special Theory of Relativity

### Statistics Category:

- STAT 302  Statistics II
- STAT 305  Introduction to Probability and Simulation
- STAT 323  Design and Analysis of Experiments I
- STAT 330  Statistical Computing with SAS
- STAT 331  Statistical Computing with R
- STAT 334  Applied Linear Models
- STAT 416  Statistical Analysis of Time Series
- STAT 417  Survival Analysis Methods
- STAT 418  Categorical Data Analysis
- STAT 419  Applied Multivariate Statistics
- STAT 421  Survey Sampling and Methodology
- STAT 423  Design and Analysis of Experiments II
- STAT 425  Probability Theory
- STAT 426  Estimation and Sampling Theory
- STAT 427  Mathematical Statistics

### Computer Science Category:

- CSC/CPE 202  Data Structures
- CSC/CPE 203  Project-Based Object-Oriented Programming and Design
- CSC 225  Introduction to Computer Organization
- CSC 349  Design and Analysis of Algorithms
- CSC/CPE 357  Systems Programming
- CSC 448  Bioinformatics Algorithms

### Mechanical Engineering Category:

- ME 211  Engineering Statics
- ME 212  Engineering Dynamics
- ME 302  Thermodynamics I
- ME 326  Intermediate Dynamics
- ME 341  Fluid Mechanics I

### Economics Category:

- ECON 311  Intermediate Microeconomics I
- ECON 312  Intermediate Microeconomics II
- ECON 313  Intermediate Macroeconomics
- ECON 403  Industrial Organization
- ECON 408  Mathematical Economics
- ECON 409  Probability Models for Economic Decisions

## Total units 56

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1. Only students in the Applied Concentration who are pursuing a Data Science minor should select Track B.
2. Students who select Track B should select the Statistics Category for their approved electives.
Consultation with advisor is recommended prior to selecting approved electives; bear in mind your selections may impact pursuit of post-baccalaureate studies and/or goals.

Other choices are also possible, and should be pre-approved in consultation with academic advisor. Approved electives are to be taken outside of the Mathematics department and should have significant applications to mathematics.