# 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 II</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.  

### 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 452 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 Advanced Topics in Data Science  
- MATH 335 Graph Theory  
- or MATH 453 Numerical Optimization

## Approved Electives
Select three courses in one of the following categories, with at least one course at the 300-level or above.  

### 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  
- PHYS 322 Vibrations and Waves  
- PHYS 323 Optics  
- PHYS 405 Quantum Mechanics I  
- PHYS 408 Electromagnetic Fields and Waves I  
- PHYS 412 Solid State Physics  
- PHYS 417 Nonlinear Dynamical Systems

### 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  
- STAT 428 Bioinformatics Algorithms

### 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

1. Only students in the Applied Mathematics concentration who are pursuing a Data Science minor should select Track B.
2. Students who select Track B should select Approved Electives from the Statistics Category that will fulfill prerequisites for courses in the Data Science minor.
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 an academic advisor. Approved Electives are to be taken outside of the Mathematics department and should have significant applications to mathematics.