# 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>
<td></td>
</tr>
</tbody>
</table>

## Tracks
Select courses from one of the following tracks. 1,2

### 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
- MATH 453 | Numerical Optimization

## Approved Electives
12

Select three courses in one of the following categories, with at least one course at the 300-level or above. 3,4

### Physics Category:
- ASTR 301 | Planetary Systems
- ASTR 302 | Stars and Galaxies
- ASTR 326 | Cosmology
- PHYS 132 | General Physics II
- 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

### 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.