APPLIED MATHEMATICS (BS)

Students earning a B.S. in Applied Mathematics will acquire foundational knowledge in the field, as well as competency in the critical thinking, technological, and communication skills necessary for its application. Applied math is a dynamic discipline with applications to many fields, including Systems Biology, Data Mining and Data Privacy, Materials Science, Computer Animation and Digital Imaging, Finance and Economics, Ecology, Epidemiology, and Climatology, among others.

Curriculum
(Effective Fall 2023)

AP Credit Policies (https://catalog.luc.edu/undergraduate/arts-sciences/mathematics-statistics/#policiestext)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 161</td>
<td>Calculus I</td>
<td>4</td>
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<tr>
<td>MATH 162</td>
<td>Calculus II</td>
<td>4</td>
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<tr>
<td>MATH 263</td>
<td>Multivariable Calculus</td>
<td>4</td>
</tr>
<tr>
<td>MATH 201</td>
<td>Introduction to Discrete Mathematics &amp; Number Theory</td>
<td>3</td>
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<tr>
<td>MATH 212</td>
<td>Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Object-Oriented Programming with Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MATH 264</td>
<td>Ordinary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>COMP 231</td>
<td>Data Structures &amp; Algorithms for Informatics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 121 &amp; PHYS 111L</td>
<td>College Physics I Lec/Dis</td>
<td>4</td>
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**Additional Science Requirements**
Select one of the following: 3
- ANTH 101 Human Origins
- BIOL 101 General Biology I
- BIOL 102 General Biology II
- CHEM 160 Chemical Structure and Properties
- CHEM 180 Chemical Reactivity I
- ENVS 101 The Scientific Basis of Environmental Issues
- PHYS 122 College Physics I Lec/Dis

**Probability and Statistics Requirements**
Select one of the following: 6
- STAT 203 & STAT 308 Introduction to Probability & Statistics and Applied Regression Analysis
- MATH 304 & MATH 305 Introduction to Probability and Introduction to Mathematical Statistics

**Upper Level Course Requirements**
- MATH 309 Numerical Methods
- MATH 356 Mathematical Modeling

**Electives A**
Select two of the following: 6
- MATH 318 Combinatorics
- MATH 331 Cryptography
- MATH 345 / STAT 388 Introduction to Financial Mathematics Derivatives
- MATH 358 Introduction to Optimization
- MATH 360 Introduction to Game Theory

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<tr>
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<tbody>
<tr>
<td>MATH 365</td>
<td>Introduction to Partial Differential Equations</td>
</tr>
<tr>
<td>MATH 366</td>
<td>Applied Dynamical Systems</td>
</tr>
<tr>
<td>STAT 321</td>
<td>Computational Aspects of Modeling and Simulation</td>
</tr>
</tbody>
</table>

**Elective B**
One elective chosen from any 300-level Math or an approved 300-level Stat course 3

**Total Hours** 55

Note: 55 total credit hours

**College of Arts and Sciences Graduation Requirements**
All Undergraduate students in the College of Arts and Sciences are required to take two Writing Intensive courses (6 credit hours) as well as complete a foreign language requirement at 102-level or higher (3 credit hours) or a language competency test. More information can be found here (https://www.luc.edu/cas/college-requirements/).

**Additional Undergraduate Graduation Requirements**
All Undergraduate students are required to complete the University Core, at least one Engaged Learning course, and UNIV 101. SCPS students are not required to take UNIV 101. You can find more information in the University Requirements (https://catalog.luc.edu/undergraduate/university-requirements/) area.

**Learning Outcomes**
- Students will have wide knowledge of and strong skills in using the methods and tools that form the foundation of applied math. These include calculus, linear algebra, and differential equations, as well as statistics and computer sciences.
- Students will acquire foundational knowledge of the language of formal mathematics and the ability to read and write rigorous and logical mathematical arguments.
- Students will be able to use applied mathematical knowledge in a wide variety of contexts. They will be able to model real-world situations mathematically, making appropriate choices as to the models and methods to employ. They will analyze these models with a variety of tools and interpret the results in a meaningful way. They will be able to present their findings in clear, professional language.
- Students will understand how the different areas and methods of applied math fit together. They will understand how these are used in modern applied mathematical settings and will also be able to fit them into a historical context.