

# MATHEMATICS, MINOR

At the core of modern theoretical science, mathematics has historically provided an expressive language as well and theoretical framework for advances in the physical sciences. It has since become central in the life and social sciences and computer science. Mathematics at Penn embraces traditional core areas of mathematics as well as developing areas (Penn is one of the world's leading centers in the application of logic to theoretical computer science). The goals of the major program are to assist students in acquiring both an understanding of mathematics and an ability to use it. The mathematics major provides a solid foundation for graduate study in mathematics as well as background for study in economics, the biological sciences, the physical sciences and engineering, as well as many non-traditional areas..

**For more information:** <https://www.math.upenn.edu/undergraduate/math-majors-and-minors/mathematics-minor> (<https://www.math.upenn.edu/undergraduate/math-majors-and-minors/mathematics-minor/>)

Review the math minor first by visiting, <http://www.math.upenn.edu/ugrad/minor.html>. Below is a planning tool that is meant to help you but does not replace the web and adviser visit requirements.

Code	Title	Course Units
<b>Minor Requirements</b>		
<i>Calculus Requirement</i>		
MATH 1400	Calculus, Part I	1
MATH 1410	Calculus, Part II	1
or MATH 1510	Calculus, Part II with Probability and Matrices	
MATH 2400	Calculus, Part III	1
<i>Algebra Requirement</i>		
Select one of the following:		1
MATH 3120	Linear Algebra	
MATH 3130	Computational Linear Algebra	
MATH 3500	Number Theory	
MATH 3700	Algebra	
MATH 5020	Abstract Algebra	
<i>Mathematics Electives or a Cognate</i>		
Select 3 course units of Math Electives or a Cognate <sup>1</sup>		3
The following courses may be eligible for the Minor but carry certain restrictions: <sup>2</sup>		
STAT 4300	Probability	
STAT 4310	Statistical Inference	
STAT 5100	Probability	
ECON 2300	Statistics for Economists	
ECON 2310	Econometric Methods and Models	
ECON 4320	Micro-econometric Techniques and Applications	
ESE 3010	Engineering Probability	
ESE 4020	Statistics for Data Science	
ESE 5300	Elements of Probability Theory	
ESE 6740	Information Theory	
ENM 5030	Introduction to Probability and Statistics	

CIS 2620 Automata, Computability, and Complexity

**Total Course Units**

**7**

- <sup>1</sup> Mathematics Electives must be math LEVEL 2000 or above.
- <sup>2</sup> Please consult with the Math Minor adviser before registering.

The degree and major requirements displayed are intended as a guide for students entering in the Fall of 2025 and later. Students should consult with their academic program regarding final certifications and requirements for graduation.