

# 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 104	Calculus, Part I	1
MATH 114	Calculus, Part II	1
or MATH 115	Calculus, Part II with Probability and Matrices	
MATH 240	Calculus, Part III	1
<i>Algebra Requirement</i>		
Select one of the following:		1
MATH 312	Linear Algebra	
MATH 313	Computational Linear Algebra	
MATH 350	Number Theory	
MATH 370	Algebra	
MATH 502	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 430	Probability	
STAT 431	Statistical Inference	
STAT 510	Probability	
ECON 103	Statistics for Economists	
ECON 104	Econometrics	
ECON 222	Advanced Econometric Techniques and Applications	
ESE 301	Engineering Probability	
ESE 302		
ESE 530	Elements of Probability Theory	
ESE 674	Information Theory	
ENM 503	Introduction to Probability and Statistics	

CIS 262	Automata, Computability, and Complexity	
Total Course Units		7

- <sup>1</sup> Mathematics Electives must be math LEVEL 200 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 2020 and later. Students should consult with their academic program regarding final certifications and requirements for graduation.