

LOGIC, INFORMATION, & COMPUTATION, MINOR

Modern mathematical logic began with work by Cantor, Frege, and other mathematicians during the last three decades of the nineteenth century who were concerned with providing a sound basis for the development of mathematical analysis. In the wake of "the crisis in the foundations of mathematics" precipitated by the discovery of various logical paradoxes at the turn of the twentieth century, mathematicians and philosophers such as Hilbert and Russell intensively pursued investigations into the logical foundations of mathematics. Connections between logic and the foundations of mathematics remained an important source for scientific developments in logic through the epochal results of Gödel in 1930 and 1931, which indicated both the scope and limits of the mechanization of mathematical reasoning. The great burst of scientific activity occasioned by Gödel's results led directly to Turing's mathematical characterization of mechanical computation in terms of simple devices, now known as Turing machines. The work of Gödel, Turing, and other logicians during the 1930s laid the scientific foundations for the revolution in computer and information technology that began in the last half of the twentieth century and continues today.

The Logic, Information, and Computation Program offers students the opportunity to engage in a systematic, integrative program of study within the School of Arts and Sciences. Logic remains one of the core disciplines in investigations of information and computation. Indeed, logic is playing a major role in advances in computer security, database technology, networking, and software engineering. Moreover, logic has expanded its role within mathematics beyond foundational studies and now enjoys rich connections with areas as diverse as algebra, analysis, and combinatorics. In light of the current importance of the investigation of computation and information from both a scientific and technological point of view, the Major and Minor in Logic, Information, and Computation will provide students with a strong background to pursue computational aspects of the natural, biological, and social sciences and prepare them for careers in information technology.

For more information: <http://logic.sas.upenn.edu/program.html>

Code	Title	Course Units
Minor Requirements		
<i>Mathematics Requirement</i>		
MATH 1400	Calculus, Part I	1
MATH 1510	Calculus, Part II with Probability and Matrices	1
or MATH 1410	Calculus, Part II	
<i>Logic, Info, & Computation Requirement</i>		
LGIC 1710	Introduction to Logic	1
or PHIL 1710	Introduction to Logic	
LGIC 2100	Discrete Mathematics I	1
or MATH 3400	Discrete Mathematics I	
Select one of the following:		1
LGIC 2200	Discrete Mathematics II	
MATH 3410	Discrete Mathematics II	
<i>Electives</i>		

Select 3 course units of Electives ¹	3
Total Course Units	8

¹ Check: <http://logic.sas.upenn.edu> for pre-approved courses.

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.