

Logic

Logical reasoning is essential in most areas of human inquiry. The discipline of Logic treats logical reasoning itself as an object of study. Logic has been one of the main branches of philosophy since Aristotle; it revolutionized the foundations of mathematics in the 20th century; and it has been called “the calculus of computer science,” with applications in many areas. Logic has also played an important role in the investigation of language and the mind, as the basis for formal semantics in linguistics and automated reasoning in artificial intelligence. With these interdisciplinary connections, Logic serves as a bridge between the humanities and STEM (Science, Technology, Engineering, and Mathematics) fields. Studying logic enhances students’ abilities to reason and argue rigorously, to read and write analytically, to discern patterns amidst complexity, and to understand abstract structures. The Logic Minor, offered through the Philosophy Department at Berkeley, consists of three core courses in symbolic logic, which may be pursued in parallel tracks within Philosophy or Mathematics, plus a choice of three upper division electives from an array of courses across Philosophy, Mathematics, Linguistics, and Computer Science. This minor is currently open to undergraduate students in the College of Letters & Science.

The Logic Minor at Berkeley consists of three core courses in symbolic logic, which may be pursued in parallel tracks within Philosophy or Mathematics, plus a choice of three upper division electives from a list of courses across Philosophy, Mathematics, Linguistics, and Computer Science.

Course Requirements for Logic Minors

Introductory

PHILOS 12A	Introduction to Logic ¹	4
or MATH 55	Discrete Mathematics	

Mathematical Logic

PHILOS 140A	Intermediate Logic ²	4
or MATH 125A	Mathematical Logic	

Computability and Logic

PHILOS 140B	Intermediate Logic ²	4
or MATH 136	Incompleteness and Undecidability	

Electives: Choose Three 10-12

At least two of these electives must be at the undergraduate level (unless an exception is granted by petition to the Logic Minor Committee). Note also that undergraduate enrollment in graduate seminars requires the consent of the instructor.

COMPSCI 172	Computability and Complexity	
LINGUIS 121	Logical Semantics ³	
LINGUIS 221	Advanced Logical Semantics	
MATH 135	Introduction to the Theory of Sets	
MATH 225A & MATH 225B	Metamathematics and Metamathematics	
MATH 227A	Theory of Recursive Functions	
MATH 229	Theory of Models	
MATH 235A	Theory of Sets	
MATH 236	Metamathematics of Set Theory	
PHILOS 134	Form and Meaning	
PHILOS 142	Philosophical Logic	
PHILOS 143	Modal Logic	

PHILOS 146	Philosophy of Mathematics
PHILOS 149	Special Topics in Philosophy of Logic and Mathematics
PHILOS 290	Seminar ⁴

Students may optionally fulfill (at most) one of their electives with a course on related formal methods and reasoning, or other courses approved by petition: PHILOS 141, PHILOS 148 & COMPSCI 188.

- ¹ Students who wish to count a different course as “equivalent” to PHILOS 12A or MATH 55 must submit a petition to the Logic Minor Committee.
- ² MATH 125A and MATH 136 may have additional prerequisites, determined by the instructor.
- ³ LINGUIS 121 requires LINGUIS 120 Introduction to Syntax and Semantics as a prerequisite.
- ⁴ The Logic Minor Committee will decide which instances of PHILOS 290 count as “Graduate Seminars in Logic” for the Logic Minor.