
Phil 225

Logic I

Time & Place: MWF 11.20-12.10, Lawrence 220

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Course Description

Logic is concerned with **correct reasoning**; the conditions under which the conclusion of an argument follows from its premises. What is perhaps a bit surprising is that logic is a science, a systematically organized body of knowledge. Rather than give a mere laundry list of good arguments, logic provides us with a general theory of the conditions under which a conclusion follows from its premises. Logic, in other words, is the **science of logical consequence**. In this course, we shall develop two methods for evaluating arguments: the *truth-table method* (which is easy to use, but limited in scope), and the *method of proof* (which is harder to apply, but has a much wider range of application).

This course – the introductory Logic I – covers the basic concepts and techniques of propositional logic and the logic of quantifiers. The more advanced Logic II discusses theories of infinity, metalogic, model theory, computability, and Gödel's Incompleteness Theorem, among other things.

Reading

You need to purchase the following textbook for this course, available at the Colgate bookstore:

Barwise, J. and J. Etchemendy, *Language, Proof and Logic*, Second Edition.

Be sure to purchase a **new copy** of the **second edition** that **includes non-transferrable software**. After purchasing the textbook, install the software and go to the LPL website to register (with your Colgate email address) and install all available updates.

The class roughly follows the outline of Parts I and II of the book, but the book's primary function is to serve as a source for exercises and additional readings; it is not a substitute for class attendance.

Grading

Ten Problem Sets (40 pts/set): Problem Sets are due at the end of the week each Sunday. Most of the Problem Sets require use of the LPL software. Your lowest Problem Set grade will be dropped.

Two In-Class Quizzes (150 pts/quiz): An in-class quiz that focuses on a sub-set of the course.

One Final Exam (300 pts): A two-hour cumulative exam that covers everything we have done in the course.

Date	Notes	Reading	Assignment
8.30 9.1		Logic as a Science (Introduction, pp. 1-10) Atomic Sentences (1.1-1.4)	'You Try It', pp. 8-10
9.4 9.6 9.8		Atomic Sentences (1.5-1.8) The Logic of Atomic Sentences (2.1-2.2) The Logic of Atomic Sentences (2.3-2.6)	Problem Set 1
9.11 9.13 9.15		Informal Fallacies (Digital Handout 1) Informal Fallacies (Digital Handout 2) Informal Fallacies (Digital Handout 3)	Problem Set 2
9.18 9.20 9.22		The Boolean Connectives (3.1-3.4) The Boolean Connectives (3.5-3.6) The Boolean Connectives (3.7-3.8)	Problem Set 3
9.25 9.27 9.29		The Logic of Boolean Connectives (4.1) The Logic of Boolean Connectives (4.2) The Logic of Boolean Connectives (4.3-4.4)	Problem Set 4
10.2 10.4 10.6	First Quiz	The Logic of Boolean Connectives (4.5-4.6) Review Day	
10.9 10.11 10.13	Fall Break	Methods of Proof for Boolean Logic (5.1-5.3) Formal Proofs and Boolean Logic (6.1-6.2)	Problem Set 5
10.16 10.18 10.20		Formal Proofs and Boolean Logic (6.3) Formal Proofs and Boolean Logic (6.4) Formal Proofs and Boolean Logic (6.5-6.6)	Problem Set 6
10.23 10.25 10.27		Conditionals (7.1-7.2) Conditionals (7.3) Conditionals (7.4-7.5)	Problem Set 7
10.30 11.1 11.3		The Logic of Conditionals (8.1) The Logic of Conditionals (8.2) The Logic of Conditionals (8.3)	Problem Set 8
11.6 11.8 11.10		Introduction to Quantification (9.1-9.4) Introduction to Quantification (9.6-9.7) The Logic of Quantifiers (10.1-10.2)	Problem Set 9
11.13 11.15 11.17	Second Quiz	The Logic of Quantifiers (10.3-10.4, 10.6) Review Day	
11.27 11.29 12.1		Multiple Quantifiers (11.1-11.2) Methods of Proof for Quantifiers (12.1-12.2) Methods of Proof for Quantifiers (12.3-12.4)	Problem Set 10
12.4 12.6 12.8		Formal Proofs and Quantifiers (13.1-13.2) Formal Proofs and Quantifiers (13.3) Formal Proofs and Quantifiers (13.4-13.5)	Problem Set 11
12.11 12.13	Review Day Review Day		