

PHIL 150: Logic

Time: WF

Instructor: Aaron Ancell

Office: West Duke 201A

Place:

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Office Hours:

You often hear people say things like “She was the logical choice for the job” or “That’s just illogical!” But what exactly is *logic*? What makes something *logical* or *illogical*? This course will introduce you to the basics of logic. You will learn how to distinguish different kinds of arguments, and how to tell good arguments from bad ones.

Just as scientists often find it useful to represent things in terms of numbers and formulas, philosophers often find it useful to represent statements and arguments using symbols and formulas. To do this, they use various systems of formal logic. In this class, you will learn to use two basic systems of formal logic: Propositional Logic and Predicate Logic.

Studying formal logic can be fun. Often it feels like playing a game or solving a puzzle. It can also be very useful. Formal logic is often used in computer science, engineering, linguistics, and, of course, philosophy. Formal logic also provides you with tools and techniques you can use to solve logic puzzles of the sort that regularly appear on standardized tests like the LSAT.

Required Texts

- Baronett, Stan (2016) *Logic*. Third Edition. Oxford University Press.
(available at the campus textbook store)

Assignments and Grading

Weekly Assignments: 20%

First Exam: 25%

Second Exam: 25%

Final Exam: 30%

Percentage grades will be converted to final letter grades using the following scale:

97-100 = A+

77-79 = C+

93-96 = A

73-76 = C

90-92 = A-

70-71 = C-

87-89 = B+

67-69 = D+

83-86 = B

65-66 = D

80-82 = B-

0-65 = F

Accommodations and Extensions

Please see me or email me as soon as possible if you require special accommodations due to religious practice, disability, medical needs, family emergency, personal crisis, or for any other reason.

Except under extenuating circumstances, extensions on assignments must be requested at least 3 days before the assignment is due. Do not email me requesting an extension at the last minute unless you have a very good reason for suddenly being unable to complete your assignment on time. The farther in advance of the deadline you request an extension, the more likely I am to grant your request.

Late Assignments

Assignments submitted after the deadline without a documented excuse will be subject to a penalty of 5% per day. For example, if an assignment is graded out of 10 points, you will lose 0.5 per day that the assignment is late. An assignment that is more than 20 days late will receive a 0.

Plagiarism and Academic Dishonesty

I will report any cases of suspected plagiarism or academic dishonesty to the Office of Student Conduct. In addition to any sanctions imposed by the Office of Student of Student Conduct, you will also receive a grade of 0 on the plagiarized assignment or exam. A second offence will result in a failing grade for the course.

You may work with one another when completing your assignments. Especially when we get to constructing proofs, you may find it is easier to practice and learn together. However, you may not simply copy answers from one another; that is cheating, and it will not help you learn the material.

For more information about what constitutes plagiarism and academic dishonesty, see: <https://studentaffairs.duke.edu/conduct/z-policies/academic-dishonesty>

| Tentative Schedule of Topics and Readings | | | | |
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| Week | Day | Topic | Reading | Weekly Assignment |
| 1 | Wednesday | Welcome to Phil150 | | <ul style="list-style-type: none"> Exercises 1B II: 4, 8, 10, 27, 31, 36, 43, 44 |
| | Friday | What is logic about? Introduction to Arguments | <ul style="list-style-type: none"> Logic Chapter 1: Introduction, § A-C | |
| 2 | Wednesday | Types of Arguments and How to Assess Them | <ul style="list-style-type: none"> Logic Chapter 1: § D-F | <ul style="list-style-type: none"> Exercises 1E: 2, 11, 15, 28 |
| | Friday | More on Assessing Arguments | <ul style="list-style-type: none"> Logic Chapter 1: § G | <ul style="list-style-type: none"> Exercises 1F II: 2, 3, 7, 8, 11, 15 Exercises 1G I: 3, 6, 8, 10 |
| 3 | Wednesday | Recognizing and Reconstructing Arguments | <ul style="list-style-type: none"> Logic Chapter 1: § B, C, & H | <ul style="list-style-type: none"> Exercises 1B I: 2, 6, 10, 15 |
| | Friday | Informal Fallacies | <ul style="list-style-type: none"> Logic Chapter 4 (all of it) | <ul style="list-style-type: none"> Exercises 1H I: 7, 11, 12 Exercises 1H II: 2, 7 Fallacies Assignment (posted on Sakai) |
| 4 | Wednesday | Logical Operators and Formulas | <ul style="list-style-type: none"> Logic Chapter 7: §A | <ul style="list-style-type: none"> Exercises 7A II: 3, 8, 15 Exercises 7A III: 2, 7, 8, 10 |
| | Friday | Compound Sentences and Formulas | <ul style="list-style-type: none"> Logic Chapter 7: §B | <ul style="list-style-type: none"> Exercises 7B.1: 2, 4, 7, 10, 14 Exercises 7B.2: 4, 7, 8, 10, 12, 18 |
| 5 | Wednesday | Translating Sentences into Propositional Logic | <ul style="list-style-type: none"> Review: Logic Chapter 7: §A-B | <ul style="list-style-type: none"> Exercises 7A I: 7, 18, 22, 26, 50 Exercises 7B.3: 2, 3, 6, 11, 14 |
| | Friday | Truth Functions and Truth Tables | <ul style="list-style-type: none"> Logic Chapter 7: §C-D | <ul style="list-style-type: none"> Exercises 7C.1: 2, 3, 4, 6, 7, 10, 15 Exercises 7D: 3, 7, 20, 40 |
| 6 | Wednesday | Contingency, Consistency, and Other Logical Notions | <ul style="list-style-type: none"> Logic Chapter 7: §E-F | <ul style="list-style-type: none"> Exercises 7E: 4, 10, 15 |
| | Friday | Truth Tables for Arguments | <ul style="list-style-type: none"> Logic Chapter 7: §G-H | <ul style="list-style-type: none"> Exercises 7F.1: 2, 3, 5 Exercises 7F.2 I: 7, 8 Exercises 7G.1 II: 2, 6, 7 |
| 7 | Wednesday | EXAM 1 | | <ul style="list-style-type: none"> Exercises 8B I: 2, 6, 10, 14, 15 |

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| | Friday | Proofs and Implication Rules | • <i>Logic</i> Chapter 8: §A-B | • Exercises 8B II: 3, 6, 8, 10, 12, 15 • Exercises 8B IV: 2, 4, 6, 7, 8, 10 |
| 8 | Wednesday | Constructing Proofs | • <i>Logic</i> Chapter 8: §C | • Exercises 8D III: 2, 4, 7, 10, 11, 12 |
| | Friday | Four More Implication Rules | • <i>Logic</i> Chapter 8: §D | |
| 9 | Wednesday | Replacement Rules | • <i>Logic</i> Chapter 8: §E-F | • Exercises 8F IV: 2, 11, 17, 31, 44 |
| | Friday | Conditional Proof, Indirect Proof, and Logical Truths | • <i>Logic</i> Chapter 8: §G-I | • Exercises 8G I: 3, 4, 8 • Exercises 8H I: 2, 4, 11 • Exercises 8I I: 3, 8 |
| 10 | Wednesday | Practice with Proofs Using CP and IP, and Review for Exam 2 | | |
| | Friday | EXAM 2 | | |
| 11 | Wednesday | Introduction to Predicate Logic | • <i>Logic</i> Chapter 9 §A | • Exercises 9A: 2, 3, 10, 12, 23, 35, 39, 50, 56 • Exercises 9B I: 2, 3 • Exercises 9B II: 2 |
| | Friday | Rules of Inference in Predicate Logic | • <i>Logic</i> Chapter 9: §B | |
| 12 | Wednesday | Constructing Proofs in Predicate Logic | • <i>Logic</i> Chapter 9: §B & C | • Exercises 9B III: 2, 6, 10 • Exercises 9C II: 3 • Exercises 9D I: 2, 3, 4 |
| | Friday | Conditional and Indirect Proofs in Predicate Logic | • <i>Logic</i> Chapter 9: §D | |
| 13 | Wednesday | Demonstrating Invalidity in Predicate Logic | • <i>Logic</i> Chapter 9: §E | • Exercises 9 F.1: 2, 4, 6, 16, 19 • Exercises 9 F.2: 2, 4, 10 |
| | Friday | Relational Predicates | • <i>Logic</i> Chapter 9: §F | |
| 14 | Wednesday | Identity | • <i>Logic</i> Chapter 9: §G | • Exercises 9 G.1: 2, 3, 4, 12, 14, 16 • Exercises 9 G.2: 2, 3, 6, 12 |
| | Friday | Review for Final Exam | | |