

LOGIC FOR PHILOSOPHY

Ted Sider, Fall 2022, Mondays 9-12
5th floor seminar room, 106 Somerset
office hrs M 12:45-1:45 & by appt

The goal is for graduate students in philosophy to achieve “logic literacy”. We will study i) the basic techniques of logic, including syntax, semantics, proof theory, metalogic, and a bit of philosophy of logic, and ii) a number of extensions of standard logic that are important in philosophy (for example, modal logic and counterfactuals). Connections to philosophical issues will be made, though the focus will be on logic itself. The course will be more broad than deep: we will examine many different systems, but will not spend a lot of time proving difficult metalogical results about these systems (except for completeness in propositional logic and modal propositional logic.)

Prerequisite

Familiarity with introductory logic. (Taking the course is possible even if you’ve never studied logic, but please see me.)

Readings

The course text is my [Logic for Philosophy](#).

Course websites

http://tedsider.org/teaching/lfp/lfp_course.html

<https://rutgers.instructure.com/courses/196452>

Requirements

Final exam during finals period (65%), periodic homework assignments (35%), posted and turned in on Canvas. If you get stuck on a homework problem, feel free to ask me for a hint. Some homework problems will be routine, others more challenging. Don’t feel bad if you can’t get all of the challenging ones; just do your best. The exam won’t contain problems as difficult as the hardest homework problems.

Schedule

- 9/12 Basics of logic; standard propositional logic, grammar and semantics. Chapter 1 (but skip the material on infinity, roughly the final two-thirds of 1.8); Chapter 2, sections 2.1–2.4.
- 9/19 Standard propositional logic: sequents, axioms, soundness; Chapter 2, sections 2.5–2.7
- 9/26 Standard propositional logic: completeness. Chapter 2, sections 2.8–2.9.
- 10/3 Nonstandard propositional logic: alternate connectives, three-valued logic, supervaluations, intuitionist logic (if time). Chapter 3 (but skip 3.2).
- 10/10 Standard predicate logic: syntax, semantics, metalogic. Chapter 4 (but skip section 4.4).
- 10/17 Additions to standard predicate logic: identity, function symbols, second-order logic, complex predicates, free logic. Chapter 5 (but skip 5.3, 5.4.1, and 5.4.2). (We will skip this day if running short on time.)
- 10/24 Propositional modal logic: syntax, semantics, establishing validity. Chapter 6 through section 6.3.2.
- 10/31 Propositional modal logic: establishing invalidity. Chapter 6, section 6.3.3.
- 11/7 Propositional modal logic: axioms. Chapter 6, section 6.4.
- 11/14 Propositional modal logic: soundness, completeness. Chapter 6, sections 6.5, 6.6.
- 11/21 Counterfactual conditionals: Stalnaker, Lewis. Chapter 8.
- 11/28 Counterfactual conditionals continued.
- 12/5 Quantified modal logic: syntax, semantics. Chapter 9 (skip section 9.7).
- 12/12 Two-dimensional modal logic. Chapter 10. (If time.)