LOGIC FOR PHILOSOPHY

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 will be a draft of a revised edition of my Logic for Philosophy, which I'll distribute via Canvas. (So there's no need to purchase the print version.)

Course websites

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http://tedsider.org/teaching/lfp/lfp_course.html
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https://rutgers.instructure.com/courses/338217
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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

1/24 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 2.1–2.2.

1/31 **No class**. (A makeup class will be scheduled.)

2/7 Standard propositional logic: sequents, proof by induction, soundness; Chapter 2, sections 2.3–2.5.

2/14 Standard propositional logic: completeness. Chapter 2, section 2.6.

2/21 Three-valued logic and (if time) intuitionist logic. Chapter 3.

2/28 Propositional modal logic: syntax, semantics. Chapter 4 through section 4.3.

3/7 Propositional modal logic: semantics (continued) and proof theory. Chapter 4, section 4.4.

3/14 Propositional modal logic: soundness, completeness. Chapter 4, sections 4.5, 4.6.

3/28 Catch-up

4/4 Counterfactual conditionals: natural language counterfactuals and Stalnaker's theory. Chapter 6, sections 6.1 and 6.2.

4/11 Counterfactual conditionals: Stalnaker's theory continued; Lewis's criticisms; counterfactuals as strict conditionals. Chapter 6, sections 6.3, 6.4.

4/18 Predicate logic: syntax, semantics, identity. Chapter 7, sections 7.1, 7.2, 7.4.1–7.4.3.

4/25 Quantified modal logic: syntax, semantics. Chapter 8, sections 8.1–8.5.

5/2 Catch-up

TBA Higher-order logic. Chapter 11. (If time.)