

# PHILOSOPHY 315

## APPLIED SYMBOLIC LOGIC

Ted Sider, Fall 2005, TF 11:30a, Hardenburgh A1  
Office hour: Tuesday, 2-3p, and by appointment  
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### Description

In intro logic you learn how to use standard logic. You only learn how to use it, and you don't learn any nonstandard logic at all. In this class we'll look more carefully at standard logic, and we'll also learn some nonstandard logic. For standard logic, we'll look more carefully at its grammar, and at notions like validity and proof. For nonstandard logic, we'll study the kinds that come up a lot in philosophy. For example, we'll investigate the idea that propositions can have three truth values, not just two. And we'll examine new symbols beyond those studied in standard logic, for instance the  $\Box$ , standing for "it is necessarily true that".

### Readings

The text for the course is my *Philosophically Useful Logic*, available at:

[http://fas-philosophy.rutgers.edu/sider/teaching/pul/pul\\_notes.pdf](http://fas-philosophy.rutgers.edu/sider/teaching/pul/pul_notes.pdf)

### Prerequisite

PHI 201 (Introduction to logic), or instructor's approval. We'll begin with a quick review of intro logic, so remembering details from PHI 201 won't be essential, but PHI 315 will be a good deal more abstract and difficult (and more interesting!).

### Requirements

Exams (80%), plus periodic homework assignments (20%). Assignments — plus announcements, due dates, review sheets, etc. — will be posted on the course web site:

<http://fas-philosophy.rutgers.edu/sider/teaching/315/315.htm>

### Schedule

- Basics of logic
- Standard propositional logic: syntax, axioms, semantics, sequents
- Nonstandard propositional logic: alternate connectives, Polish notation, three-valued logic
- Standard predicate logic: syntax, semantics
- Additions to standard predicate logic: identity, function symbols, descriptions
- Propositional modal logic: syntax, axioms, semantics, soundness, tense logic
- Counterfactual conditionals: Stalnaker, Lewis