# SEMINAR: TOPICS IN LOGIC

PHIL 395
Fall 2005
T, Th 1:10–2:30 P'gill G54
Office hours: T, Th 2:30–4:00

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In your introductory logic class, you spent most of the time symbolizing propositions and arguments at increasing levels of complexity, and using systems of proof to demonstrate logical properties of those propositions and arguments. You learned the languages of propositional (or sentential) logic and first order predicate logic, and you learned formal proof techniques (natural deduction or truth trees) to demonstrate that certain propositions in those languages were tautological or contradictory, or that given arguments were valid or invalid. In this course we'll take off from that point and move toward two goals. First, we'll begin to pay more attention to the languages and proof systems *themselves* as objects of systematic study. We'll look at the grammar and semantics for the languages, and we'll start to prove important results about the proof techniques. Second, we'll explore and extend the resources of the languages of logics in philosophically useful respects. We'll discuss identity, definite descriptions, modal logics, and counterfactuals, which are all central to philosophical discussions in ethics, metaphysics, epistemology, philosophy of language and mind.

**Text**

Ted Sider, *Philosophically Useful Logic* (ms).
Supplementary essays to be distributed.
Useful but not required:
Richard Jeffrey, *Formal Logic: Its Scope and Limits*
Brian Chellas, *Modal Logic: An Introduction*
See list at beginning of Sider text for other suggestions

**Coursework**

1. Attendance, preparation, and participation (and perhaps a quiz or two): 1/5
2. Problem presentations (2): 1/5 total
3. Problems (2 per week): 1/5 total
3. Midterm quiz and Final: 1/5 each

**Preliminary Schedule**

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|---|---|
| T 9-6<br>Th 9-8 | Introduction and Review<br>Nature of Logic (ch 1) |
| T 9-13<br>Th 9-15 | Metatheory of PL (2.1–2.3)<br>Soundness and Completeness of PL (2.4) |
| T 9-20<br>Th 9-22 | Natural Deduction in PL (3.1–3.3)<br>Theoremhood and Consequence (3.4) |
| T 9-27<br>Th 9-29 | Variations and Deviations from PL (4.1–4.2)<br>(4.3–4.4) |
| T 10-4<br>Th 10-6 | Metatheory of Predicate Logic (ch 5)<br>(ch 5) |
| T 10-11<br>Th 10-13 | Extensions of Predicate Logic: Identity (6.1)<br>Function Symbols (6.2) |
| T 10-18<br>Th 10-20 | Definite Descriptions (6.3)<br>Fall Break |
| T 10-25<br>Th 10-27 | Propositional Modal Logic (7.1–7.3)<br>Axiomatic Systems (7.4) |
| T 11-1<br>Th 11-3 | Axiomatic Systems (7.4)<br>(7.4) |
| T 11-8<br>Th 11-10 | Semantics of MPL (7.5)<br>(7.5) |
| T 11-15<br>Th 11-17 | Soundness and Completeness of MPL (7.6)<br>(7.7) |
| T 11-29<br>Th 12-1 | Counterfactuals (ch 9)<br>(ch 9) |
| T 12-6 | Conclusion |

**A Few Notes on My Written Work Policy**

You may discuss problems and general solution strategies with other students on homework only, not quizzes or examinations (including take-home exams). However, when it comes time to write up homework sets, you should work independently. Please cite anyone with whom you work. Do not, under any circumstances, just copy or rework someone else's solutions. Also, I won't accept late homework without a dean's excuse.