

Fall Semester, 2006
Instructor: J. Horty

PHIL 478:
Philosophical Logic

Description

The course will study selected extensions of and alternatives to classical propositional logic. The extensions include modal, conditional, and tense logics; the alternatives include intuitionistic, many valued, and relevance logics. In each case, we will consider the philosophical issues raised by these logics, though most of our time will be devoted to becoming familiar with the logics themselves, from both a semantic and a proof-theoretic standpoint. Throughout the course, we will trade depth for breadth; the goal is not to study any of these logics in mathematical detail, but just to get a sense of the range of possibilities.

Time and place

Tuesday and Thursday from 12:30 till 1:45, in Skinner 1112.

Office, phones, etc.

Office: Skinner Building, Rm. 1101. Office phone: x55892. Home phone: 301-585-4586. You are welcome to call me at home, but please keep it between 9:00am and 9:00pm. Email: horty@umiacs.umd.edu. Note: I'm not good at answering complicated questions by email, and would much rather meet in person or talk on the phone for that, but email is fine for quick administrative things. I'll let you know my exact office hours once they've sorted themselves out, but I'm generally available for appointments.

Course materials

There are two main texts for the course, which should be in the bookstore:

- J. C. Beall and Bas C. van Fraassen. *Possibilities and Paradox: An Introduction to Modal and Many-Valued Logic*. Oxford University Press (2003), xviii+233 pp.
- Graham Priest. *An Introduction to Non-Classical Logic*. Cambridge University Press (2001), xi+242 pp.

Material for copying will be available in the Philosophy Lounge, and most of the more recent things are available on the web. I'll let you know where to find various things as we get to them.

Course work

Graduate students attending the class are required to help present some of the material, either technical or philosophical. This won't figure into your grade in any formal way, but you have to do it to get a grade. Undergraduates are also welcome to help presenting material, but not required.

All students who want credit for the course must turn in routine homework assignments and occasional problem sets, and also take midterm and final exams. The homeworks will not be graded, but you have to do them to get a grade. The problems sets will count for 50% of your grade, the exams for another 50%, with the exact weighting between exams to be determined.

Also, you really should come to class. I won't follow the books and papers all that closely, and much of what we do will appear only on the blackboard. The way to learn this material is to come to class, take notes, ask questions, and do your homework. That being said, there is no formal requirement of attendance.

Course topics

Here is a tentative list, subject to student interest and how things go.

1. Review of classical propositional logic
Readings: Beall and van Fraassen [Chapters 3 and 4], Priest [Chapter 1]
2. Basic modal logic: the system K
Readings: Beall and van Fraassen [Chapters 3 and 4], Priest [Chapter 1]
Related material: Chellas [4, Chapters 3 and 4]
3. Standard modal logics: T (KT), S4 (KT4), B (KTB), S5 (KT45)
Readings: Beall and van Fraassen [Chapters 3 and 4], Priest [Chapter 1]
Related material: Chellas [4, Chapters 3 and 4]
4. Applied modal logic I: deontic logic (KD)
Readings: Føllesdal and Hilpinen [9], van Fraassen [18]
Related material: Gowans [10]
5. Applied modal logic II: time, action, obligation
Readings: Thomason [16], Horty and Belnap [13, Selections], Horty [12]
Related material: Thomason [17]
6. Applied modal logic III: conditionals
Readings: Beall and van Fraassen [Section 6.3], Priest [Chapter 5]; Stalnaker [15], Lewis [14, Selections]
Related material: Chellas [4, Chapters 10]

7. Intuitionistic logic

Readings: Beall and van Fraassen [Section 6.4], Priest [Chapter 6]; Belnap [2] Dummett [6, Selections], Dummett [5, Selections], Heyting [11, Selections]

Related material: Dummett [8, Selections]

8. First degree entailment

Readings: Beall and van Fraassen [Chapter 7], Priest [Chapter 8]; Anderson and Belnap [1, Selections], Belnap [3, Selections]

9. Other many-valued logics

Readings: Beall and van Fraassen [Chapters 8 and 9], Priest [Chapter 7]

10. Relevant implication

Readings: Anderson and Belnap [1, Selections]

References

- [1] Alan Anderson and Nuel Belnap. *Entailment: The Logic of Relevance and Necessity*. Princeton University Press, 1975.
- [2] Nuel Belnap. Tonk, plonk, and plink. *Analysis*, 22:130–134, 1961.
- [3] Nuel Belnap. How a computer should think. In Gilbert Ryle, editor, *Contemporary Aspects of Philosophy*, pages 30–56. Oriel Press, 1977.
- [4] Brian Chellas. *Modal Logic: An Introduction*. Cambridge University Press, 1980.
- [5] Michael Dummett. The philosophical basis of intuitionistic logic. In H. E. Rose and J. C. Sheperdson, editors, *Logic Colloquium '73*, pages 5–40. North Holland Publishing Co., 1973. Reprinted in [7].
- [6] Michael Dummett. *Elements of Intuitionism*. Oxford University Press, 1977.
- [7] Michael Dummett. *Truth and Other Enigmas*. Harvard University Press, 1978.
- [8] Michael Dummett. *The Logical Basis of Metaphysics*. Harvard University Press, 1991.
- [9] Dagfinn Føllesdal and Risto Hilpinen. Deontic logic: an introduction. In Risto Hilpinen, editor, *Deontic Logic: Introductory and Systematic Readings*, pages 1–35. D. Reidel Publishing Company, 1971.
- [10] Christopher Gowans, editor. *Moral Dilemmas*. Oxford University Press, 1987.
- [11] Arend Heyting. *Intuitionism: An Introduction*. North-Holland Publishing Co., 1956.
- [12] John Horty. Agency and obligation. *Synthese*, 108:269–307, 1996.

- [13] John Horty and Nuel Belnap. The deliberative stit: a study of action, omission, ability, and obligation. *Journal of Philosophical Logic*, 24:583–644, 1995.
- [14] David Lewis. *Counterfactuals*. Oxford University Press, 1973.
- [15] Robert Stalnaker. A theory of conditionals. In *Studies in Logical Theory (American Philosophical Quarterly Monograph Series, No. 2)*. Basil Blackwell, 1968.
- [16] Richmond Thomason. Indeterminist time and truth-value gaps. *Theoria*, 36:264–281, 1970.
- [17] Richmond Thomason. Combinations of tense and modality. In Dov Gabbay and Franz Guethner, editors, *Handbook of Philosophical Logic, Volume II: Extensions of Classical Logic*, pages 135–165. D. Reidel Publishing Company, 1984.
- [18] Bas van Fraassen. Values and the heart’s command. *The Journal of Philosophy*, 70:5–19, 1973.