# Logic I: classical and modal logic

*Dr. Jacob Archambault*

## Course description

This course provides a general introduction to propositional and first-order classical logic, along with its modal extensions. By the end of the course, the student shall have achieved facility with the semantics and proof-theory of a wide variety of modal systems, while achieving familiarity with the philosophical debates motivating and surrounding them.

## Required texts

Priest, Graham (2008). *An Introduction to Non-Classical Logic: from If to Is*. Cambridge: Cambridge University Press.

## Course requirements

**Homework** (Hurdle Requirement) **–** Each week, I will select three problems (one on proof theory, one on semantics, and one in metatheory) for you to hand in. Assignments are due at the beginning of each class. Students who fail to turn in four or more problem sets automatically fail the course. In addition, at least two-thirds of all problems must be completed correctly for a passing grade.

**Final Paper** (50%) – Through the course, we will be reading articles, both classic and contemporary, on some of the philosophical issues involved in modal logic. At the end of term, you are to hand in a paper (3000 words or fewer) engaged with some topic broached in the course. The paper may be philosophical in nature, or it may be a more technical contribution.

**Final Exam** (50%) – A cumulative exam based on the technical material learned over the course of the semester. Administered in class.

## Syllabus

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| Week 1 | Priest, ch. 1: Classical Propositional Logic<br>Pap, Arthur (1962) "The Laws of Logic" in *An Introduction to the Philosophy of Science* (New York: Free Press), pp. 94-106. |
| Week 2 | Priest, ch. 12: Classical Predicate Logic<br>Russell, Bertrand (1905). "On Denoting" *Mind* 14:56, pp. 479-493. |
| Week 3 | Priest, ch. 13: Free Logic<br>Lejewski, Czeslaw (1954). "Logic and Existence" *British Journal for the Philosophy of Science* 5:18, pp. 104-119. |
| Week 4 | Priest, ch. 2: Basic Modal Logic<br>Stalnaker, Robert C. (1976). "Possible Worlds" *Noûs* 10:1, pp. 65-75. |
| Week 5 | Priest, ch. 3: Normal Modal Logics<br>Plantinga, Alvin (1975). *The Nature of Necessity* (Oxford: Oxford University Press), ch. 1. |
| Week 6 | Priest, ch. 14: Constant Domain Modal Logics<br>Plantinga, Alvin (1975). *The Nature of Necessity* (Oxford: Oxford University Press), ch. 2. |
| Week 7 | Priest, ch. 15: Variable Domain Modal Logics |

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| | Lewis, David (1968). "Counterpart Theory and Quantified Modal Logic" *The Journal of Philosophy* 65:5, pp. 113-126. |
| Week 8 | Priest, ch. 16: Necessary Identity in Modal Logic<br>Kripke, Saul (1971). "Identity and Necessity" reprinted in *Philosophical Troubles: Collected Papers, Volume 1* (Oxford: Oxford University Press, 2011), pp. 1-26. |
| Week 9 | Priest, ch. 17: Contingent Identity in Modal Logic<br>Gibbard, Allan (1975). "Contingent Identity" *Journal of Philosophical Logic* 4:2, pp. 187-221. |
| Week 10 | Priest, ch. 4: Non-Normal Modal Logics I<br>Priest, Graham (1992). "What is a Non-Normal World?" *Logique et Analyse* 35, 291-302. |
| Week 11 | Priest, ch. 18: Non-Normal Modal Logics II<br>Priest, Graham (2005). *Towards Non-Being* (Oxford: Oxford University Press), ch. 2. |
| Week 12 | Priest, ch. 5: Conditional Logics I<br>Edgington, Dorothy (2001). "Conditionals" in Lou Goble (ed.), *The Blackwell Guide to Philosophical Logic* (Malden: Blackwell), pp. 385-414. |
| Week 13 | Priest, ch. 19: Conditional Logics II<br>Lewis, David (1976). "Probabilities of Conditionals and Conditional Probabilities" *Philosophical Review* 85, pp. 297-315. |