

PHILO 394.85 Non-Classical Logic:

Professor Daniel Addison – Spring 2016

Logic is the systematic and precise study of reasoning—a topic of particular interest to mathematicians and computer scientists as well as philosophy. Philosophers have often functioned as the R&D wing of this collaboration, thinking up and formalizing new logical techniques and systems designed to solve problems that can't be solved by traditional (a.k.a. "classical") logic. This course will be an introduction to some of these non-classical logics, their philosophical motivations, and some of their applications, which have proven useful to philosophers, mathematicians, and computer scientists.

In particular, we may cover intuitionistic logic (which are preferred by mathematical constructivists), modal logics (which specialize in reasoning about necessity and possibility), tense/temporal logic (used to reason about time), many-valued logic (spurred by the idea that there are truth values other than 'true' and 'false'), and paraconsistent logics (which are useful for reasoning from inconsistent premises), and various logical techniques designed to solve paradoxes arising from conditionals ("if...then..." sentences). The course will study properties of these systems through possible-world semantics and tableaux proofs, which are algorithmic and hence of possible distinct interest to those in computer science.

The textbook for the course is Graham Priest, *An Introduction to Non-Classical Logic: From Ifs to Is*, 2nd Edition (Cambridge University Press, 2008).