

Modal Logic

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This course introduces students to modal logic, the branch of modern logic that studies the logic of modal operators such as necessity and possibility. The first part of the course covers modal propositional logic, with an emphasis on the basic ideas and techniques of possible worlds semantics and on the relationship between various formal systems studied in the literature. We will consider some applications of these formal systems, in particular examining the logic of metaphysical possibility, deontic logic, epistemic logic, and temporal logic. The second part of the course deals with quantification in modal logic, in which some related philosophical issues, concerning identity, de re modality, descriptions, and variable/constant domains will be discussed. Time permitting, we will cover some material on the logic of counterfactual conditionals.

The main text will be Sider: *Logic for Philosophy*.

Week 1: **Introduction & review of propositional logic**

Sider: 1.8, 2

Week 2: **Propositional modal logic: language and possible worlds semantics**

Sider: 6.1 - 6.3.1

Week 3: **Propositional modal logic: validity and countermodels**

Sider: 6.3.2 - 6.3.3

Week 4: **Propositional modal logic: some systems (K, T, D, B, S4 and S5)**

Sider: 6.4

Salmon: 'The Logic of What Might Have Been'

Week 5: **Applications of modal logic: deontic and epistemic**

Sider: 7.1 - 7.2

Chisholm: 'Contrary-To-Duty Imperatives and Deontic Logic'

Williamson: *Knowledge and Its Limits*, Ch 5.

Week 6: **Applications of modal logic: temporal**

Sider: 7.3

Week 7: **Counterfactuals: natural language**

Sider: 8.1

Week 8: **Counterfactuals: Lewis and Stalnaker semantics**

Sider: 8.2 - 8.3

Lewis: *Counterfactuals*, Ch 1

Week 9: **Review of predicate logic**

Sider: 4

Week 11: **Predicate modal logic: language and possible worlds semantics**
Sider: 9.1 - 9.3

Week 12: **Predicate modal logic: validity and countermodels**
Sider: 9.4

Week 13: **Predicate modal logic: variable domains, identity, and descriptions**
Sider: 9.5 - 9.6
Bennett: 'Actualism'