

PHILOSOPHY 413: FORMAL METHODS IN PHILOSOPHY

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| CONTACT INFO | Sarah Moss ssmoss@umich.edu office: 2232 Angell Hall office hours: Tuesdays 3:00–5:00 and by appointment |
| DESCRIPTION | This is a survey of formal tools used in contemporary philosophy. The course covers elements of formal semantics, propositional modal logic, conditionals, probability theory, and decision theory. Each section of the course begins with an introduction to formal material and ends with a contemporary paper presupposing that material. |
| PREREQUISITES | Satisfaction of the QR/1 requirement with either second semester calculus, an advanced course in logic, a course in statistics above STAT 265, or a course in economics. |
| MATERIALS | Heim and Kratzer, <i>Semantics and Generative Grammar</i> Bennett, <i>A Philosophical Guide to Conditionals</i> Scheduled readings are listed in normal font in the syllabus. Italics indicate supplementary readings that you may also want to explore. Readings and problem sets will be posted on our course webpage at http://ctools.umich.edu . |
| GRADING | Six problem sets: 60% Final exam: 35% Class participation: 5% |
| SCHEDULE | 1/7 introduction: crash course in prerequisite propositional logic 1/12 use and mention, corner quotes, substitutional quantification, proper use of argument schemas Quine 1981: <i>Mathematical Logic</i> , §6: "Quasi-Quotation" MacFarlane 2008: "Substitutional Quantifiers" 1/14 elementary set theory, properties of relations, introduction to lambda notation, semantic types McCawley 1993: "A Digression Into Set Theory" Heim and Kratzer 1998: <i>Semantics in Generative Grammar</i> , Ch. 1 Formal semantics 1/19 syntactic categories, drawing syntactic trees, Functional Application McCawley 1993: "Some Syntactic Prerequisites" Heim and Kratzer 1998: <i>Semantics in Generative Grammar</i> , Ch. 2–3 1/21 Predicate Modification, predicational and specificational copular sentences, definite descriptions Heim and Kratzer 1998: <i>Semantics in Generative Grammar</i> , Ch. 4 |

- 1/26 relative clauses, variable assignments, Traces and Pronouns Rule,
Predicate Abstraction
Heim and Kratzer 1998: *Semantics in Generative Grammar*, Ch. 5
problem set 1 due
- 1/28 contexts, indices and index-shifting operators,
Intensional Functional Application, monsters
von Fintel and Heim 2005: *Intensional Semantics Lecture Notes*, Ch. 1
- 2/2 Ninan 2009: "Semantics and the Objects of Assertion"

Propositional modal logic

- 2/4 frames, valuation functions, models, validity in a model
Sider 2010: *Logic for Philosophy*, §6.1–6.2
Hughes and Cresswell 1996: A New Introduction to Modal Logic, Ch. 1
- 2/9 validity in a formal system, axioms T and 4, constructing countermodels
Sider 2010: *Logic for Philosophy*, §6.3.1–6.3.2
Hughes and Cresswell 1996: A New Introduction to Modal Logic, Ch. 2–3
problem set 2 due
- 2/11 semantic validity proofs, formal systems K, T, and S4
Sider 2010: *Logic for Philosophy*, §6.3.3
Hughes and Cresswell 1996: A New Introduction to Modal Logic, Ch. 4
- 2/16 formal systems D, B, and S5
Sider 2010: *Logic for Philosophy*, §6.4
- 2/18 Salmon 1989: "The Logic of What Might Have Been"

Conditionals

- 2/23 contrasting indicative and subjunctive conditionals, the Ramsey test,
Stalnaker on indicative conditionals
Bennett 2003: *A Philosophical Guide to Conditionals*, Ch. 4, 9
Ramsey 1929: "Law and Causality"
Adams 1970: "Subjunctive and Indicative Conditionals"
Stalnaker 1975: "Indicative Conditionals"
problem set 3 due
- 2/25 contraposition, transitivity, antecedent strengthening,
non-truth-conditional semantics for indicatives
Bennett 2003: *A Philosophical Guide to Conditionals*, Ch. 9–10
Gibbard 1981: "Two Recent Theories of Conditionals"
Veltman 1996: "Defaults in Update Semantics"
Swanson 2006: "Interactions with Context"
Edgington 2008: "Do Counterfactuals Have Truth Conditions?"

- 3/9 the limit and uniqueness assumptions, Conditional Excluded Middle
 Bennett 2003: *A Philosophical Guide to Conditionals*, Ch. 11
 Lewis 1973: *Counterfactuals*
 Stalnaker 1978: "A Defense of Conditional Excluded Middle"
- 3/11 dynamic semantics for subjunctive conditionals
 Gillies 2007: "Counterfactual Scorekeeping"
 von Fintel 2001: "Counterfactuals in a Dynamic Context"
- 3/16 Moss 2009: "On the Pragmatics of Counterfactuals"
 Hajek 2009: "Most Counterfactuals are False"
 problem set 4 due

Probability theory and updating

- 3/18 probability theory
 Strevens 2006: "Notes on Bayesian Confirmation Theory," Ch. 1–3
 Skyrms 1999: *Choice and Chance: An Introduction to Inductive Logic*
 Hacking 2001: *An Introduction to Probability and Inductive Logic*
- 3/23 conditionalization
 Strevens 2006: "Notes on Bayesian Confirmation Theory," Ch. 4–5
 Joyce 2003: "Bayes' Theorem"
 Weisberg 2009: *Varieties of Bayesianism*, §3.3
- 3/25 Jeffrey conditionalization and the Judy Benjamin problem
 Weisberg 2010: "Varieties of Bayesianism," §3.4–3.5
 Jeffrey 1965: *The Logic of Decision*, Ch. 11
 Levi 1967: "Probability Kinematics"
- 3/30 Dutch book arguments
 Weisberg 2010: "Varieties of Bayesianism," §4.1
 Hájek 2008: "Dutch Book Arguments," §1–3
- 4/1 Bartha and Hitchcock 1999: "No One Knows the Date or the Hour. . ."
 Leslie 1996: *The End of the World*
 problem set 5 due

Decision theory, game theory, and social choice theory

- 4/6 modelling decision problems, expected utility, the Sure Thing Principle
 Weatherson 2008: *Decision Theory Notes*, Ch. 9–10
 Savage 1954: *The Foundations of Statistics*
 Jeffrey 1965: *The Logic of Decision*, Ch. 1–5
 Joyce 1999: *Foundations of Causal Decision Theory*, Ch. 1–3

- 4/8 evidential and causal decision theory
Weatherson 2008: *Decision Theory Notes*, Ch. 16–18
Lewis 1981: “Why Ain’cha Rich?”
Gibbard and Harper 1985: “Counterfactuals and Two Kinds of Expected Utility”
Joyce 1999: *Foundations of Causal Decision Theory*, Ch. 4–5
- 4/13 game theory
Osborne and Rubinstein 1994: *A Course in Game Theory*, Ch. 1–2
Fudenberg and Tirole 2000: *Game Theory*
Resnik 1987: *Choices: An Introduction to Decision Theory*, Ch. 5
- 4/15 social choice theory
Weatherson 2008: *Decision Theory Notes*, Ch. 25–26
Saari 2001: *Decisions and Elections*, §2.6
Resnik 1987: *Choices: An Introduction to Decision Theory*, Ch. 6
- 4/20 Arntzenius, Elga, and Hawthorne 2004: “Bayesianism, Infinite Decisions. . .”
Stalnaker 1999: “Extensive and Strategic Forms: Games and Models for Games”
Meacham 2009: “Binding and its Consequences”
problem set 6 due