

FIL2405/4405:

PHILOSOPHICAL LOGIC AND THE PHILOSOPHY OF MATHEMATICS

Spring, 2023

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WEEK ONE (27th January): PROPOSITIONAL LOGIC AND BASIC LOGICAL NOTIONS

Here, we will do a brief recap of semantics and the proof theory of non-modal propositional logic. With the latter, we will focus on axiom systems. We will also recap some basic logic notions, e.g., theoremhood, logical truth, derivation, logical consequence, consistency, etc.

Readings.¹

*G. E. Hughes and M. J. Cresswell, *A New Introduction to Modal Logic*, Routledge, 1996, pp. 3-13
Jc Beall and Shay Allen Logan, *Logic: The Basics*, Routledge, 2017, Part I.

WEEK TWO (3rd February): PROPOSITIONAL MODAL LOGIC (LANGUAGE AND PROOF THEORY)

Here, we cover propositional modal logic characterised syntactically, or proof theoretically, focusing on axiom systems. This will cover the main normal modal systems of K, T, B, S4, and S5.

Readings.

*G. E. Hughes and M. J. Cresswell, 1996, pp. 13-36, 51-56, 58-60, 62-63.

WEEK THREE (10th February): PROPOSITIONAL MODAL LOGIC (SEMANTICS—MODAL THEORY)

Here, we will cover propositional modal logic characterised semantically, focusing on model-theoretic semantics for normal modal logics, including K, T, B, S4, and S5.

Readings.

*G. E. Hughes and M. J. Cresswell, 1996, pp. 36-50, 56-57, 60-62, 63-64.

¹Starred readings “*” are essential. Other readings are recommended for further discussion of the topic.

WEEK FOUR (17th February): WHICH SYSTEM IS “RIGHT”?

Here, we will take a brief philosophical interlude from the formal details. An important philosophical question concerns which of the logics we have already discussed are “right” for different varieties of necessity and possibility. We will focus on which of the logics already discussed is right for metaphysical modality, as well as discuss what we might mean by “right” when we say one logic is the right modal logic.

Readings.

*Salmon, N, “The Logic of What Might Have Been”, *The Philosophical Review*, 1989, pp. 3-34.

*Dummett, M, “Could There Be Unicorns?” in *The Seas of Language*, OUP, 1996, pp. 328-348.

Hale, B, “S5 as the Logic of Metaphysical Modality: Two Arguments for and Two Arguments against”, in *Essence and Existence*, Bob Hale and Jessica Leech (eds.), OUP, 2020, pp. 141-148.

WEEK FIVE (24th February): SIMPLE QUANTIFIED MODAL LOGIC (SQML)

Here, we look at how we can add quantifiers to propositional modal logic, focusing on SQML.

Readings.

G. E. Hughes and M. J. Cresswell, Chp. 13.

WEEK SIX (3rd March): SQML, ACTUALISM, AND POSSIBILISM

Here, we look at some philosophical issues raised by simple quantified modal logic, focusing on how actualists—those who think that everything actually exists—and possibilists—those who think that, in some sense, there are things which do not actually exist—approach SQML.

Readings.

*Menzel, C, “Actualism”, *The Stanford Encyclopaedia of Philosophy*, (Summer 2022 Edition), Edward N. Zalta (ed.), URL = <<https://plato.stanford.edu/archives/sum2022/entries/actualism/>>, Sections 1-2.

*Linsky, B and Zalta, E “In Defense of the Simplest Quantified Modal Logic”, *Philosophical Perspectives*, Vol. 8, 1994, pp. 431-458.

*Bennett, K, “Proxy “Actualism””, *Philosophical Studies*, Vol. 129, No. 2, 2006, pp.263-294

Williamson, T, “Truthmakers and the Converse Barcan Formula”, *Dialectica*, Vol. 53, No. 3/4, 1999, pp. 253-270.

WEEK SEVEN (10th March): QUANTIFIED MODAL LOGIC AND IDENTITY

Here, we look at how we can add identity to quantified modal logic, and the issues this raises.

Readings.

*G. E. Hughes and M. J. Cresswell, *A New Introduction to Modal Logic*, Routledge, 1968, pp. 312-314.

*Kripke, S, *Naming and Necessity*, Harvard University Press, 1980, Lecture III.

WEEK EIGHT (17th March): CONTINGENTISM, NECESSITISM, AND MODAL LOGIC

Here, we will look at another philosophical issues raised by simple quantified modal logic with identity: the debate between contingentists—those who think that there might have been something which might not have existed—and necessitists—those who think that, necessarily, everything necessarily exists.

Readings.

*Williamson, T, *Modal Logic as Metaphysics*, Oxford University Press, 2013, Chp. 1.

*Nelson, M, “The Contingency of Existence”, in *Metaphysics and the Good: Themes from the Philosophy of Robert Merrihew Adams*, Samuel Newlands and Larry M. Jorgensen (ed.), OUP, 2009, pp. 95-155.

Goodman, J, “Williamson on necessitism”, *Canadian Journal of Philosophy*, Vol. 46, No. 4/5, 2016, 613-39.

WEEK NINE (24th March): NOT-SO-SIMPLE QUANTIFIED MODAL LOGIC

Here, we will look at various means of setting up quantified modal logic to avoid the issues that arise in connection with Simple Quantified Modal Logic.

Readings.

*G. E. Hughes and M. J. Cresswell, pp. 289-296

WEEK TEN (31st March)" ANTI-EXCEPTIONALISM ABOUT LOGIC I

Here, we pivot and look at a broad way of understanding logic, anti-exceptionalism—the view that logical theories are continuous with, and not exceptional to, theories in the sciences. This view of logic has lay behind many of the arguments already discussed in the course, particularly in the debate over contingentism and necessitism.

Readings.

*Williamson, T, “Methodological Afterword”, in *Modal Logic as Metaphysics*, OUP, 2013, pp. 423-429.

*Williamson, T, “Logic, Metalogic and Neutrality”, *Erkenntnis* 79, 2014, pp. 211-231.

Russell, G, “The Justification of the Basic Laws of Logic”, *Journal of Philosophical Logic*, 44, 2015, pp. 793-803

WEEK ELEVEN (14th April): ANTI-EXCEPTIONALISM ABOUT LOGIC II

Here, we look at arguments against anti-exceptionalism about logic, and, in turn, some arguments against the methodological underpinnings of some arguments for necessitism.

Readings.

*Hjortland, O. T, “Anti-Exceptionalism About Logic”, *Philosophical Studies*, Vol. 174, 2017, pp. 631-658.

*John MacFarlane, “In what sense (if any) is logic normative for thought”, delivered at the American Philosophical Association Central Division meeting.

WEEK TWELVE (21st April): IS MODAL LOGIC A LOGIC AT ALL?

Here, we end by looking at skepticism of modal logic as logic, focusing on Quine's arguments.

Readings.

*W. V. O. Quine, "Reference and Modality", in *From a Logical Point of View*, W. V. O. Quine (eds.), 1953.

*Borghini, A, *Critical Introduction to the Metaphysics of Modality*, 2016, Section 2.2 "Quinean Skepticism".

Divers, J, "How Skeptical is Quine's "Modal Skepticism"?", *The Monist*, 100(2), 2017, pp. 194-210.