

# PHIL 5506: Formal Methods in Philosophy

Spring 2021, 2-3.15 Tuesdays and Thursdays

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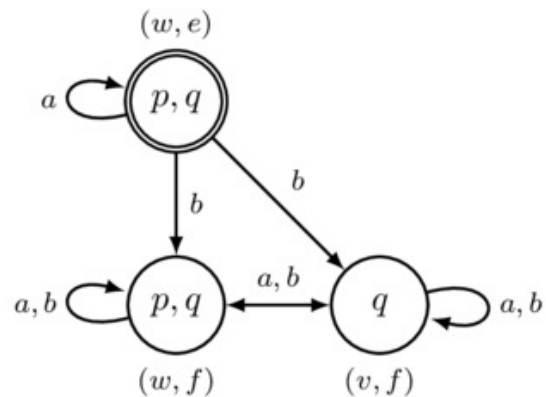
**Zoom:** [virginiatech.zoom.us/my/dhoek](https://virginiatech.zoom.us/my/dhoek)

**Office hours:** Wednesdays 2-4pm

## Course Description

In this course you will learn a variety of formal techniques that are frequently used in philosophy, and practice reading technical philosophy papers. Formal methods are used in every area of philosophy,

and so readings range all the way from the ethics and history of philosophy to philosophy of mind and philosophy of maths. Topics covered include modal logic, confirmation theory and metalogic.



## Assessment

You will be assessed on two take-home exams (50%), weekly exercises graded mostly for completion (35%) and class participation (15%). You'll also get two jokers. You can use a joker to skip the exercises for a week, except in starred weeks, which can't be skipped. You can also choose to write a 4,000 word term paper that makes use of one of the formal tools you learnt about in the course. This will then count for 30% of your grade, get you three more jokers, and allow you to skip the final exam.

**Reading.** Our main textbook for the first part of the course will be Ted Sider's *Logic for Philosophers* — *LFP* for short. You should prepare for each class by doing the assigned exercises and readings. A provisional schedule for the readings is provided below. Often you will only be required to read a portion of the article or chapter — the rest will be optional; sometimes I will designate a whole paper as optional reading. Since many of the readings contain complex and subtle arguments, you should do the required readings carefully and slowly, making an effort to understand all the reasoning steps the author makes. Write down questions you have about the readings, and things you did not understand. There will be plenty of opportunity to discuss those questions in class.

**Homework Submission.** All assignments should be submitted through Canvas.

**Zoom Etiquette.** Excepting bathroom breaks, you **must** have your camera on throughout the class — otherwise I will count you as absent. I can make occasional exceptions to this rule, but you will have to contact me in advance to explain your reasons. Make sure you are in a room that is quiet enough that you can concentrate on the class, and we can hear you when you speak. Much as with an in-person class, you should be on time, and not be in your dressing gown.

**Academic Integrity.** The Academic Integrity expectations for Hokies are the same in an online class as they are in an in-person class. Hokies are expected to meet the academic integrity standards of Virginia Tech at all times. The normal sanction for a violation of the Honor Code is an F\* as your final course grade, where the \* indicates an integrity violation.

**Missing class.** If you need to miss a class, always email me *in advance*. If you do miss a class, it is your responsibility to contact a fellow student to fill you in. If, after that you still have questions about what was covered, please meet with me (for instance during office hours) to discuss them.

**Late assignments.** All homework assignments should be handed in by 8pm on the due date. The default policy is that late submissions are not accepted, and incur a D or F grade. If you foresee that you will not be able to hand in your assignment on time, I *may* grant you an extension if you let me know *well in advance* — no later than two days before the due date. Even if an extension is granted, there could still be a grade penalty. Don't be a perfectionist.

**Office Hours.** You are always welcome to come see me during office hours with any questions you have about the course, about probability, or about paper ideas. If you are struggling to keep up with the course for any reason, you should definitely come to see me.

**Wellness Principles.** Virginia Tech is committed to protecting the health and safety of all members of its community. By participating in this class, all students agree to abide by the Virginia Tech Wellness principles. To uphold these principles, in this class you must do the following:

- ▶ Wear a face covering during class, including as you enter and exit the classroom
- ▶ Maintain the designated distancing guidelines of the classroom
- ▶ Enter and exit class according to posted signage

If you are exhibiting even the slightest sign of illness, you must not attend an in-person class. Notify me by email and follow the instructions posted at <https://vt.edu/ready/health.html#tips> .

## Schedule

### *Introduction*

January 19. Vann McGee, "A Counterexample to Modus Ponens," 462-464

January 21. *LFP*, §1.1-7

### **I. Languages and Logics**

#### *How to Build a Language\**

January 26. George Boolos, "Quotational Ambiguity"

January 28. *LFP*, §2.1-4, §3.4

*How to Build a Logic*

February 2. Truth Trees (handout)

February 4. *LFP*, §2.6

*Sets, Relations, Functions and Quantification\**

February 9. *LFP*, §1.8, §4.1-2

February 11. *LFP* §5.6; Andrew Bacon, "Quantificational Logic and Empty Names": intro, §1, §5

**II. Modal Logic***Necessity and Possibility\**

February 16. *LFP* §6.1-3

February 18. *LFP* §6.4

*Deontic Logic*

February 23. *LFP* §7.1; Roderick Chisholm, Contrary-to-Duty Imperatives and Deontic Logic

February 25. **Spring Break Day**

February 26. **Take-Home Midterm Exam Distributed**

*Epistemic and Doxastic Logic*

March 2. *LFP* §7.2

March 4. Timothy Williamson, *Knowledge and Its Limits*, Chs. 5-6

March 5. **Take-Home Midterm Exam Due**

**III. Probability***Confirmation Theory\**

March 9. Michael Strevens, "Notes on Bayesian Confirmation Theory," §1-§4.3

March 11. Dawid and Gillies, "A Bayesian Analysis of Hume's Argument Concerning Miracles."

**optional:** David Hume, *Of Miracles*

*Decision Theory*

March 16. Johanna Thoma, "Decision Theory," §1, §3.1-2

March 18. Frank Ramsey, "Truth and Probability," §3

**IV. Conditionals***Counterfactual Conditionals and Causal Decision Theory*

March 23. **either** *LFP* §8.1-3, §8.6-8, **or** Robert Stalnaker, "A Theory of Conditionals"

March 25. Arif Ahmed, *Newcomb's Problem*, introduction

**optional:** David Lewis, "Probabilities of Conditionals and Conditional Probabilities."

*Dynamic Logic*

March 30. Irene Heim, "On the projection problem for presupposition."

April 1. Jeroen Groenendijk and Martin Stokhof, "Dynamic Predicate Logic"

**V. Sundry Topics***Mereology*

April 6. **Spring Break Day**

April 8. Peter Simons, *Parts: A Study in Ontology*, §1.1-2; Ned Markosian, "Simples."

*Subject Matters and Questions*

April 13. David Lewis, "Relevant Implication."

**optional:** Stephen Yablo, *Aboutness*, Ch. 1-2

April 15. Seth Yalcin, "Belief as Question-Sensitive."

**VI. The Limits of Logic and Language***To Infinity and Beyond*

April 20. Agustin Rayo, "Infinite Cardinalities"

April 22. Daniel Hoek, "Chance and the Continuum Hypothesis," introduction.

*Soundness and Completeness of First-Order Logic*

April 27. *LFP* §4.4-5

April 29. Timothy Bays, "Skolem's Paradox"

April 30. **Take-Home Final Exams Distributed**

*Gödel's Incompleteness Theorems*

May 4th. Peter Smith, *An Introduction to Gödel's Theorems*, Ch. 1; Sider §5.4.3.

May 7th. **Take-Home Final Exams Due**