

# PHL109: Introduction to Formal Reasoning and Decision Making

Fall 2020, Online

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## Course Description

This course is an introduction to the formal tools philosophers use to understand reasoning and decision making. Before diving into the formalism, we begin the course in unit 1 with an overview of what it means to be a good reasoner. This introductory material will both provide you with necessary context for why the formal tools matter, and also help you become a better thinker. We then work through the details of how to formally represent the two main kinds of reasoning: deductive and inductive. Deductive reasoning involves figuring out what must be true given what one already accepts. So, in unit 2, we study propositional logic, which provides a simple model of deduction. But we often also care about how likely things are given what we accept. So, in unit 3, we study probability theory as a model of inductive reasoning, which involves figuring out what one should take to be the likelihood of various possibilities. In the final unit, we conclude by looking at expected value theory, which builds on probability theory and is a theory of how one should make decisions under uncertainty.

## Course Structure

There are two ‘classes’ per week, and for each class I will upload about 45 minutes worth of pre-recorded video lecture. There will also be a short reading to go along with each lecture. In addition to the pre-recorded lectures, I will host 1 hour of interactive office hours per week (typically on Friday afternoon) where I will answer any questions. For the review classes I will hold additional office hours. I may also create a Piazza page or other discussion board for the course if there is demand.

You will submit all coursework online through the Tophat platform (see below). Late submissions will not be accepted (there are no “late penalties”; rather, late work simply gets a 0), except where there is a legitimate reason for an extension and proof that it is needed (e.g. medical documentation). I have adopted this strict late policy because there are evaluations every week and it is crucial that they are done on time so that you keep up with the course content.

## Course Material

All course readings will be available through the Tophat platform (see below), which includes an amazing online textbook on reasoning and decision-making.

If you would like to get a head start on deductive logic, probability theory, or decision theory, you may consult the following online textbooks. You may also consult these resources throughout the course if you require additional help.

- [forall x Calgary: An Introduction to Formal Logic.](#)
- [Symbolic Logic: A First Course.](#)
- [Modern Logic: A Text in Elementary Symbolic Logic.](#)
- [Odds & Ends: Introducing Probability & Decision with a Visual Emphasis.](#)

## Top Hat

For instructions on how to create a Top Hat account and enrol in our Top Hat Pro course, please refer to the invitation sent to your school email address or consult Top Hat's Getting Started Guide (<https://bit.ly/31TGMIw>).

If you already have a Top Hat account, go to [TBD] to be taken directly to our course. If you are new to Top Hat, go to <https://app.tophat.com/register/student> and search for our course with the following join code: [TBD]

Top Hat Pro may require a paid subscription. A full breakdown of all available subscription options can be found here: [www.tophat.com/pricing](http://www.tophat.com/pricing).

Should you require assistance with Top Hat at any time please contact their Support Team directly by way of email ([support@tophat.com](mailto:support@tophat.com)), the in-app support button, or by calling 1-888-663-5491. Specific user information may be required by their technical support team when troubleshooting issues.

## Course Evaluation

1. Weekly Quizzes: 10%. 8 online quizzes.
2. Problem Sets: 20%. 4 problem sets.
3. Mid-term: 25%. Take home test. 24 hours to complete.
4. Final Exam: 35%. Take home test. 48 hours to complete.

Throughout the readings there are multiple choice questions to test your comprehension. These questions inside the readings are not graded.

All quizzes and problem sets are due by midnight on the Sunday of the week they are assigned (see the course schedule below). They are made up entirely of multiple choice questions. You have two attempts to answer the questions, and will receive immediate feedback after the first attempt.

Details about the midterm and final will be distributed closer to their date.

## Core Curriculum Goals: QQ or QR

The course meets core curriculum goals QQ (Formulate, evaluate, and communicate conclusions and inferences from quantitative information) and QR (Apply effective and efficient mathematical or other formal processes to reason and to solve problems).

## Additional Information

*Classroom Etiquette:* During the interactive sessions you must not engage in any behaviour that is disruptive or disrespectful to me or your fellow students. Ensure that your microphone and video are off when you are not actively making a contribution to the discussion.

*E-mail Policy:* I will not answer e-mails that either ask substantive questions about the course material, or ask for information easily obtainable by checking the syllabus or course website.

*Academic Integrity:* You must follow the [Rutgers Academic Integrity Policy](#).

*Course Webpage:* You are expected to check the course webpage on a regular basis to check for updates with regard to assignments and course readings.

## Schedule (Tentative)

Below is tentative course schedule for the material we will cover. As mentioned above, all readings will be made available through the course Tophat page.

Week	Dates	Topic	Evaluation
<b>Unit 1: Introduction</b>			
1	September 1	Reasoning	
	September 3	Mindset	Quiz 1
2	September 8	Clarity	
	September 10	Entailment	Quiz 2
<b>Unit 2: Deductive Logic</b>			
3	September 15	Basic Concepts of Logic I	
	September 17	Basic Concepts of Logic II	Problem Set 1
4	September 22	Syntax	
	September 24	Symbolization I	Quiz 3
5	September 29	Symbolization II	
	October 1	Symbolization III	Quiz 4
6	October 6	Semantics I	
	October 8	Semantics II	Problem Set 2
7	October 13	Semantics III	
	October 15	Semantics IV	Quiz 5
8	October 20	Review	
	October 22		Midterm
<b>Unit 3: Probabilities</b>			
9	October 27	Introducing Probability	
	October 29	The Gambler's Fallacy	Quiz 6
10	November 3	Probability: Basic Concepts	
	November 5	Conditional Probability	Quiz 7
11	November 10	More Probability Concepts	
	November 12	Probability Theory: Bayes' Rule	Problem Set 3
12	November 17	Multiple Conditions	
	November 19	Probability and Induction	Quiz 8
<b>Unit 4: Decision Making</b>			
13	November 24	Introducing Decision Making	
	November 26	No class—Thanksgiving	
14	December 1	Decision Making: Basic Concepts	
	December 3	Decision Making: Utility	Problem Set 4
15	December 8	Decision Making: Paradoxes	
	December 10	Review	
	Exam Period		Final Exam