

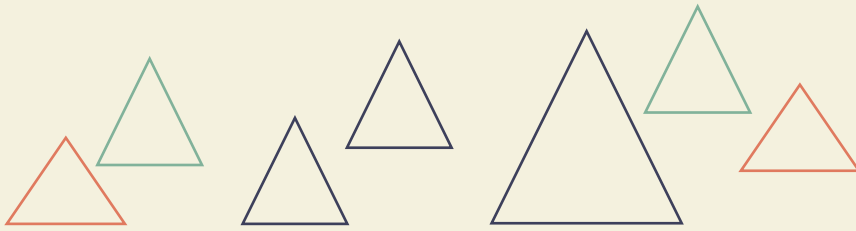
# PHIL 9. Introduction to Logic

## Course Description

PHIL 9 is an introduction to symbolic logic. We'll go over two formal logic systems and the ways you can use them to evaluate sentences and arguments for important logical properties. We'll cover sentential logic and predicate logic, including formal deduction, semantics, and translation from natural to symbolic languages for each system.

Summer 2022. 10 Week (June 20<sup>th</sup> - Aug26th)

Remote and asynchronous (no in-person meetings, and no live Zoom call meetings).



## Course learning Outcomes

The principle learning outcome is for students to develop a 'tool-kit' they can use to think and write logically. The tools of formal logic will help you to understand the logical structure of sentences and arguments and the importance of logical properties like tautology, consistency, and validity.

The class is designed so that students will have ample opportunities to practice the necessary skills for developing their tool-kits. By the end of the course, students will have practiced:

- Talking about logic and the ways it can be used.
- Translating ordinary language sentences and arguments into the formal languages of sentential logic and predicate logic.
- Checking sentences and arguments for logical properties like tautology, consistency, and validity and explaining why they have those properties.
- Choosing derivation strategies like reductio ad absurdum or conditional proofs.
- Explaining the contributions from the philosophy of language and philosophy of mind that led and depend on the development of our logical tools.
- Applying their formal logic to philosophical writing (in non-logic areas).

These tool-kits are transferable to other philosophical courses, course in other majors, and to careers outside of philosophy. Throughout the course, the teaching team will draw connections to ideas in other philosophy courses and careers outside of philosophy (especially in programming or writing). We will also invite you to think of connections to other ideas in your major.




### Susan Stebbing

"There is an urgent need today for the citizens of a democracy to think well."  
—Susan Stebbing, *Thinking to Some Purpose* 1939.

"[Stebbing's *Thinking to Some Purpose*] is a manual of first-aid to clear thinking, showing how to detect illogicalities in other people's mental processes and how to avoid them in our own.' Just as a car-user's manual instructs the owner on how to (and how not to) navigate the road, *Thinking to Some Purpose* was written to provide its readers with manual for how to start thinking in the right kind of way and avoid common pitfalls"

—Pelican Review

### Instructor:

Jordan Dopkins 

[jdopkins@ucsc.edu](mailto:jdopkins@ucsc.edu)

he/him/his

Office hours: tbd or by appointment via Zoom.

### Teaching Assistants:

### LSS Tutor:

sign up here: [LINK](#)

## Optional Synchronous Zoom Meetings (where to get extra help via Zoom).

There are a few ways for students to receive live, synchronous teaching support through Zoom. All Zoom links can be found here, [LINK](#).

- **Office Hours**

Individual or small group meetings with course instructor or teaching assistant. Get help with problem sets, weekly assessments, or research project.

- **Discussion Sections**

Review logical concepts and abilities from lecture with TA. Work in small-groups to complete problems from the problem set and prepare for the Weekly Assessment.

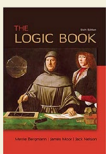
- **Review Sessions**

Review logical concepts and abilities in order to prepare for the Weekly Assessment.

### Books

There is one book you have to buy for the course. Merrie Bergmann, James Moor, and Jack Nelson: *The Logic Book* (6th Edition). (Available at the [Bay Tree Bookstore](#)). A cheaper [soft-bound edition](#) and an [e-book rental](#) are also available. The 5th Edition of *The Logic Book* is also acceptable and can be found used on a number of sites like [Gettextbooks.com](#) and [Bookfinder.com](#). If you cannot afford a copy, please email me at [jdopkins@ucsc.edu](mailto:jdopkins@ucsc.edu).

You can use an earlier version of the book, but if you choose to do that, you will need to refer to the 6th edition exercises [here](#) when doing the problem sets. [Here is Chapter 1 of The Logic Book 6th edition](#) for you to read while your copy of the textbook is on order.



*The Logic Book, 6<sup>th</sup> Edition*

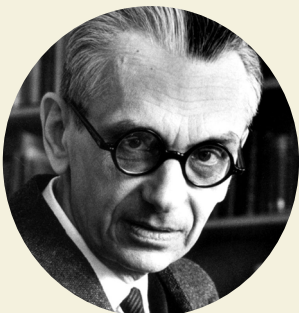
### Videos

All of the lectures are recorded and posted in the modules on the Canvas course website. You'll hear two different voices in the lectures. That's because some of the lectures were recorded by our course narrator, philosophy Professor [John Bowin](#). The others are recordings of review sessions (you can also attend those live! [LINK](#)), or short mini lectures recorded by me.

I'll record review sessions (you can also attend those live! [LINK](#)) each Thursday evening and post those to the course Canvas.



There are 'quiz questions' embedded in most of the videos. The quizzes are not graded, but you should do your best on them anyway! Think of them the same way you think about a teacher asking a question to the class.



### Kurt Gödel.

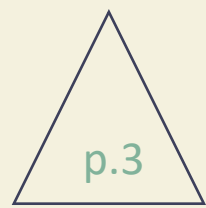
"Gödel's incompleteness theorems are among the most important results in modern logic. These discoveries revolutionized the understanding of mathematics and logic, and had dramatic implications for the philosophy of mathematics. There have also been attempts to apply them in other fields of philosophy, but the legitimacy of many such applications is much more controversial." —SEP [link](#)

### Discord

I'll create a Discord for the course for students to use. I'll also use a channel for a livechat during the Review Sessions on Thursdays. Here's a quick guide on how to use discord. [LINK](#).



# Assignments and grading



Problem sets	35%
Weekly Assessments	50%
Research Project	15%
Extra Credit	+<5%

## Problem Sets

Each problem set contains a wide variety of practice problems. Figuring out how to solve them is an important part of learning logic and succeeding in the class. By completing practice sets, students will (i) practice the abilities they learned from the reading and lectures, (ii) check their understanding of logical concepts, and (iii) assess their strengths and weaknesses before the Weekly Assessments.

Problem sets are published Sunday evening and due each Thursday by 5pm. Answers are published Thursday evening. That gives students about four days to complete each problem set. Graders will evaluate work to make sure students are setting up problems correctly and, at least half the time, coming up with the right answer. If so, the problem set gets a 100%. If not, students receive a temporary grade of 60% and three days to resubmit the work to earn up to 90%. In order to get credit for the resubmission, you'll also need to complete a Problem Set Resubmission Worksheet ([link](#)).

## Weekly Assessments

Each weekly assessment contains 10 challenging problems. Students solve them using the logical concepts and abilities learned each week. By completing the weekly assessments students challenge their understanding of logical abilities and concepts essential for moving forward in the course. The lowest two Weekly Assessment grades will be dropped.

Weekly Assessments are published on Friday at 9am and close on Saturday at 5pm. Students have **2 hours** to complete the assessment once they start it. Each weekly assessment contains an **optional** written portion that you can complete for up to 20 points of extra credit on that weekly assessment. The written portion is, roughly, a 750 word essay about logical concepts from the week's material. They're due Sunday night at 5pm each week. Students can view the optional, written portion before the assessment.

### Preparing for Weekly Assessments.

The best way to prepare for the Weekly Assessments is to keep up with the lectures and problem sets. But! Here are two extra options.

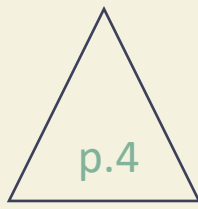
(1) I'll post a set of really tricky problems each week called "Jordan's Puzzlers". These are not graded, so you can use them to check your own understanding of logical concepts and abilities. The puzzler problems are **more difficult and complex** than the ones on the weekly assessment. So, if you can do these, you'll probably do great on the weekly assessments!

(2) I'll host a live 1hr review session each Thursday at 4pm via Zoom and Discord. I'll serve up some tips for success on the weekly assessments, provide practice problems, organize small group work, and answer any questions you have about the material.

## Research Project

The Research Project is a short presentation of some research on one of the formal logic systems we cover in the class: categorical logic, propositional logic, or quantifier logic. Students will research the history of the logic system, including relationships to philosophical projects, some important benefits of the system, and weaknesses or limitations to the system. Then, summarize the research into a, roughly, one page summary or 5 minute presentation.

It's up to you to determine how to format the research project. You might create a research poster, a pamphlet, a podcast, a video, an interview, a piece of art (with an artist's statement), a website, a wiki, or find some other way to present your research. Its up to you! I'll provide a rubric and detailed instructions (with plenty of examples!) for the assignment at the end of week 4. I will also recommend some contemporary philosophers for you to research in the assignment instructions and during lectures each week. The most creative and well-researched projects will be awarded extra-credit.



### Extra Credit

Students can earn up to 5 points of extra credit toward their final grade. There are two ways to earn extra credit:

- Participate in a discussion section: participate in a Zoom discussion section. Students can earn .5 (half) a point of extra credit for each week they participate in a discussion section. Discussion section dates/times posted here ([link](#)).
- Attend a weekly review session on Thursday at 4pm ([link](#)). I'll randomly select answers for extra credit points during in-class polls and questions.

### Grading Scale

- 100-97 = A+
- 96-93 = A
- 92-90 = A-
- 89-87 = B+
- 83-86 = B
- 80-82 = B-
- 77-79 = C+
- 73-76 = C
- 70-72 = C-
- 67-69 = D+
- 63-66 = D
- 60-62 = D-
- 50-60 = F

### Late Work and Email Policies

Late assignments and make-up work will be handled on a case-by-case basis. If it is decided that the work will be accepted, then you should expect a 10 point penalty per day the assignment is late. Of course, if there is documented emergencies/illness, DRC accommodations, or conflicts with religious observance, or something like that, then the teaching team is happy to accommodate you. If you can, please notify the instructors **in advance** of your need for an exception to course deadlines and attendance requirements. It is much easier for your TA to grant extensions before an assignment deadline than after.

Please direct any questions you may have regarding assignments, evaluative feedback, or administrative concerns to the instructor. When sending an email, it's helpful to include "PHIL 9" in the subject line.

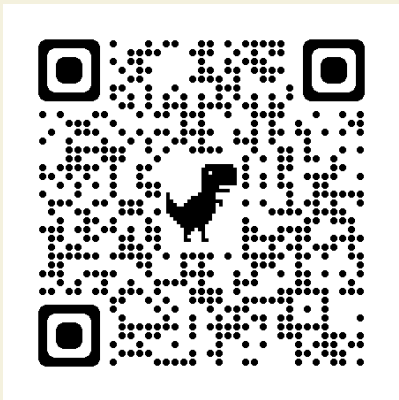
If I don't respond to an email within 48 hours, I probably missed your email. Sorry! Please send another!

### Week At a Glance

While the class is asynchronous and remote, there's still a weekly assessment schedule and opportunities for live meetings via Zoom. Here's a week at a glance in the course. The **optional** live meeting opportunities are highlighted in blue. All Zoom links found here: [LINK](#)

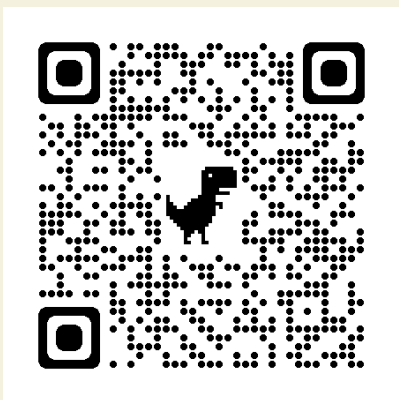
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<ul style="list-style-type: none"><li>• Module published @ 5pm PST</li><li>• Problem set published @ 5pm</li><li>• Optional written portion of previous Weekly Assessment due @ 5pm</li></ul>		<ul style="list-style-type: none"><li>• Discussion Section B @ 1pm.</li></ul>	<ul style="list-style-type: none"><li>• LSS Review Sessions TBD</li></ul>	<ul style="list-style-type: none"><li>• Problem sets due @5pm.</li><li>• Review session @ 4pm.</li><li>• Discussion Section C &amp; A @ 11am.</li><li>• Discussion Section C @ 1pm.</li></ul>	<ul style="list-style-type: none"><li>• Weekly Assessment published @9am</li></ul>	<ul style="list-style-type: none"><li>• Weekly assessment due @ 5pm</li></ul>

Week	Dates	Course Module Topics	Assigned Readings
1	6/20 6/26	Basic Notions of Logic  Sentential Logic: Symbolization and Syntax (part 1)	<ul style="list-style-type: none"> <li>➤ <i>The Logic Book</i>, Chapter 1 and Chapter 2.1. <b>P.1-23</b></li> <li>➤ <i>Elementary Logic</i>, Introduction. <b>P.1-9</b></li> </ul>
2	6/27 7/3	Sentential Logic: Symbolization and Syntax (Part 2)  Sentential Logic: Semantics (Part 1)	<ul style="list-style-type: none"> <li>➤ Pick one: Blog Post: <i>Logic: A Quick Remedial Lesson</i> <a href="#">link</a> Or Blog Post: <i>Why Study Formal Logic?</i> <a href="#">Link</a></li> <li>➤ The Logic Book, Chapter 2.2, 2.3, 3.1, 3.2, and 3.3 <b>p.24-57 &amp; 69-92.</b></li> </ul>
3	7/4 7/10	Sentential Logic: Semantics (Part 2)  Sentential Logic: Derivations (Part 1)	<ul style="list-style-type: none"> <li>➤ The Logic Book, Chapter 3.4, 3.5, 5.1, 5.2, and 5.3. <b>p.92-105 &amp; 146-209</b></li> </ul>
4	7/11 7/17	Sentential Logic: Derivations (Part 2)  Derivation Practice (Part 1)	<ul style="list-style-type: none"> <li>➤ The Logic Book, Chapter 5.4. <b>p. 214-225</b></li> <li>➤ Podcast on the history of Logic and Proof Theory; Anupam Das on Logic and Proof Theory. <a href="#">Link</a>.</li> </ul>
5	7/18 7/24	Derivation Practice (Part 2)	<ul style="list-style-type: none"> <li>➤ Pick One: Watch: History of Symbolic Logic <a href="#">LINK</a> OR Ted Talk, What does it take to learn math? To live a life? <a href="#">LINK</a>.</li> </ul>
6	7/25 7/31	Predicate Logic: Symbolization and Syntax (Part 1)	<ul style="list-style-type: none"> <li>➤ The Logic Book, Chapter 7.1, 7.2, 7.3, 7.4, &amp; 7.5. <b>p. 262-328</b></li> </ul>
7	8/1 8/7	Predicate Logic: Symbolization and Syntax (Part 2)  Predicate Logic: Semantics (Part 1)	<ul style="list-style-type: none"> <li>➤ The Logic Book, Chapter 8.1 &amp; 8.2. <b>p. 329-359</b></li> <li>➤ <i>Elementary Logic</i>, History of Modern Logic <b>p.226-230</b></li> </ul>
8	8/8 8/14	Predicate Logic: Semantics (Part 2)  Predicate Logic: Derivations (Part 1)	<ul style="list-style-type: none"> <li>➤ The Logic Book, Chapter 8.3, 8.4, 8.5, 10.1, &amp; 10.2. <b>p. 358-381 &amp; 474-792</b></li> </ul>
9	8/15 8/21	Predicate Logic: Derivations (Part 2)  Predicate Logic: Derivation Practice (Part 1)	<ul style="list-style-type: none"> <li>➤ The Logic Book, Chapter 10.3, &amp; 10.4. <b>p. 521-544</b></li> </ul>
10	8/22 8/26	Predicate Logic: Derivation Practice (Part 2)	No readings.
11+	-7/1	Weekly Assessment 10 and Research Project Due by 8/27.	*Unfortunately, I cannot offer extensions on either assignment. If you need extra time, you will have to take an incomplete and submit the work during Fall quarter.



## Campus Resources

[link](#)



## Canvas Support

[link](#)



## Disability Resource Center

[link](#)



## Academic Integrity

[link](#)

### Land Acknowledgment

The land on which we gather is the unceded territory of the Awaswas-speaking Uypi Tribe. The Amah Mutsun Tribal Band, comprised of the descendants of indigenous people taken to missions Santa Cruz and San Juan Bautista during Spanish colonization of the Central Coast, is today working hard to restore traditional stewardship practices on these lands and heal from historical trauma.

### Deadlines

- Add - Thursday, June 30
- Drop - Monday, July 4 (tuition reversed)
- No classes are in observance of Juneteenth June 20 & Independence Day July 4
- Request "W" Grade - Sunday, July 24 (no tuition reversal)
- Change Grade Option - Sunday, August 21
- Grades Due - Thursday, September 1