

PHI 451/651: Logic and Language

Syracuse University, Fall 2025

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Office Hours: Tu 2:30–3:30pm in 523 HL, or by appointment

Course Description

The aim of this course is to introduce students to core concepts, methods, and results from formal logic that are of philosophical importance. We will study basic set theory, topics in the model- and proof-theory of propositional logic, modal logic, and first-order logic, as well as the application of formal techniques to the study of meaning in natural language.

This course is open to both undergraduate and graduate students. We will cover difficult material at a relatively quick pace and you'll be expected to put in a substantial amount of independent work every week. PHI 251 or an equivalent introductory logic course is a prerequisite. Come talk to me if you're unsure about your preparation.

Texts

We will work with the following textbooks:

- Open Logic Project (Fall 2025). *Sets, Logic, Computation*
- Sider, T. (2010). *Logic for Philosophy*. Oxford University Press, Oxford
- Heim, I. and Kratzer, A. (1998). *Semantics in Generative Grammar*. Blackwell, Malden, MA

Sider's *Logic for Philosophy* will be our primary textbook, make sure to get a copy (we'll start using it in week 3 or so). Pdfs of all other course materials will be provided on Blackboard.

Course Requirements

- (i) Class participation and attendance (UG: 10%, G: 10%)
- (ii) Weekly problem sets and quizzes (UG: 90%, G: 70%)
- (iii) Article exegesis (G: 20%)

'UG' indicates the percentage weight for undergraduates, 'G' for graduate students. The article exegesis is due on the last day of class and is required of graduate students only. Problem sets will usually get posted on Thursday evenings and will be due by the start of class the following Thursday. How many quizzes we have will be determined as the semester proceeds. Letter grades are based on the scale of 93+ = A, 90-92 = A-, 87-89 = B+, 83-86 = B, 80-82 = B- etc.

Problem sets must be typed. Any text editor will do, but a good resource for typing work in logic is LaTeX (I use this for my handouts, and all our textbooks were written with it). An online LaTeX editor is available here: <https://www.overleaf.com>

Schedule

The precise schedule and material covered will depend on the pace at which we proceed. It is your responsibility to ensure that you know what the reading and homework is for each class meeting. Roughly, we will cover the following topics in the order indicated:

Part 1: Set Theory

- Basic set theory: sets, relations, functions. (Open Logic, Ch. 1–3)
- Diagonalization, infinity, and the size of sets. (Open Logic, Ch. 4; Sider Ch. 1)

Part 2: Propositional Logic (Sider Ch. 2–3)

- The semantics of propositional logic.
- Axiomatic proofs in propositional logic.
- Metatheoretic proofs by induction.
- Soundness and completeness of propositional logic.

Part 3: Modal Propositional Logic (Sider Ch. 6)

- Semantics and countermodels in modal propositional logic.
- Axiomatic systems for modal propositional logic and frame correspondence.

Part 4: Predicate Logic (Sider Ch. 4–5)

- Symbolization in predicate logic with identity; Russell's theory of descriptions.
- Semantics of predicate logic.

Part 5: Formal Semantics for Natural Language

- Truth-conditional semantics and the lambda calculus (Heim & Kratzer, Ch. 1–2)
- Quantifiers in English (Heim & Kratzer, Ch. 6)

Course Policies

Electronic Devices

Phones and computers should be put away during class. If you use a tablet to take notes *by hand*, you may do so, but I expect you to use it *for that purpose only*. If a device becomes a distraction to you or those around you, you won't be allowed to use it anymore. If you have a CDR accommodation to use an electronic device let me know.

Email Policy

I will do my best to reply to emails about brief administrative questions within 24 hours on weekdays. For substantive inquiries, come see me during office hours or schedule an appointment.

Extensions and Absences

To request an extension on an assignment you need to contact me *at least two days* before the due date. Unexcused late work will not be accepted.

You can have two unexcused absences without it affecting your grade. Additional absences should come with an official excuse (e.g. a doctor's note). If you expect to miss a class meeting due to a religious observance, please inform me of the dates on which you will be absent within the first two weeks of the semester. You will be marked absent if you arrive late, sleep, text on your phone, email, go on the internet, or engage in other distracting activity.

Disability Accommodations

Syracuse University values access and inclusion; we are committed to a climate of mutual respect and full participation. There may be aspects of the instruction or design of this course that result in barriers to your inclusion and full participation in this course. I invite any student to contact me to discuss strategies and/or accommodations (academic adjustments) that may be necessary to ensure equitable access, and to collaborate with the [Center for Disability Resources](#) (CDR) in this process.

If you would like to discuss disability-related accommodations or register with CDR, please visit Center for Disability Resources. Please call (315) 443-4498 or email CDRspecialist@syr.edu for more detailed information.

CDR is responsible for coordinating disability-related academic accommodations and will work with the student to develop an access plan. Since academic accommodations are generally not provided retroactively, please contact CDR as soon as possible to initiate this process.

Health

Well-being and mental health are significant predictors of academic success. It is critical to take care of yourself physically and emotionally and to effectively navigate stress, anxiety, and depression. Please familiarize yourself with the range of resources the Barnes Center provides (<https://ese.syr.edu/bewell/>) and seek out support for mental health concerns as needed. Counseling services are available 24/7, 365 days, at 315-443-8000.

Academic Integrity

Don't cheat. Discussing problem sets with me and others in the class is fine, and indeed encouraged. However, all the work that you submit *must have been written up by you individually and reflect your own understanding of the material*. Copying someone else's work or submitting nearly identical answers produced as a group is considered a violation of academic integrity, as is the use of generative AI. Here is SU's academic integrity language:

As a pre-eminent and inclusive student-focused research institution, Syracuse University considers academic integrity at the forefront of learning, serving as a core value and guiding pillar of education. Syracuse University's Academic Integrity Policy provides students with the necessary guidelines to complete academic work with integrity throughout their studies. Students are required to uphold both course-specific and university-wide academic integrity expectations such as crediting your sources, doing your own work, communicat-

ing honestly, and supporting academic integrity. The full Syracuse University Academic Integrity Policy can be found by visiting go.syr.edu/academic-integrity, selecting, “Academic Integrity,” and “Expectations and Policy.”

Upholding Academic Integrity includes the protection of faculty’s intellectual property. Students should not upload, distribute, or share instructors’ course materials, including presentations, assignments, exams, or other evaluative materials without permission. Using websites that charge fees or require uploading of course material (e.g., Chegg, Course Hero) to obtain exam solutions or assignments completed by others, which are then presented as your own violates academic integrity expectations in this course and may be classified as a Level 3 violation. All academic integrity expectations that apply to in-person assignments, quizzes, and exams also apply online.

Students found in violation of the policy are subject to grade sanctions determined by the course instructor and non-grade sanctions determined by the School or College where the course is offered. Students may not drop or withdraw from courses in which they face a suspected violation. Any established violation in this course may result in course failure regardless of violation level.

All generative-AI tools are prohibited in this course because their use inhibits achievement of the course learning objectives. This policy applies to all stages of project and writing processes including researching, brainstorming, outlining, organizing, and polishing. Do not use Generative-AI tools to create any content (i.e., images and video, audio, text, code, etc.). If you have any questions about a feature and whether it is considered Generative-AI, ask your instructor.

This class will use the plagiarism detection and prevention system Turnitin. You will have the option to submit your papers to Turnitin to check that all sources you use have been properly acknowledged and cited before you submit the paper to me. I will also submit all papers you write for this class to Turnitin, which compares submitted documents against documents on the Internet and against student papers submitted to Turnitin at Syracuse University and at other colleges and universities. I will take your knowledge of the subject matter of this course and your writing level and style into account in interpreting the originality report. Keep in mind that all papers you submit for this class will become part of the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers.