

# Introduction to Symbolic Logic

Instructor: Bell Bixin Guo

Email: [bguo@macalester.edu](mailto:bguo@macalester.edu)

Course website: <https://bixinguo.github.io/Logic/2025.html>

Course Description	1
Learning Objectives	2
Recommended Textbooks	2
Classroom Policy	2
Office Hours and Email Guide	3
Requirements and Assessments	3
Grading breakdown	5
Topics (subject to revision)	6
Academic Integrity	6
Other Resources and Policy Statements	6

## Course Description

This is an introductory course to logic, especially symbolic logic. It introduces tools and formal methods for understanding and evaluating arguments in academic as well as everyday contexts. No previous acquaintance with logic is required. Nonetheless, a willingness to learn technicalities and to work at a certain level of abstraction is desirable. An *Introduction to Symbolic Logic* course is offered every year.

## Learning Objectives

The immediate goal of this course is to (i) provide students tools and formal methods for analyzing and evaluating arguments, (ii) get a glimpse of how reasoning works, (iii) develop the ability to think abstractly about formal systems, (iv) get a sense of the relation between formal systems and ordinary discourse, and, more specifically, (v) learn how to translate sentences into the language of symbolic logic and to use the rules of manipulating those sentences to see what they entail. The general aim behind this course is to provide students a foundation through which they can improve their reading, writing, and reasoning abilities.

## Recommended Textbooks

Haim Gaifman, *A Course in Symbolic Logic*.

Irving M. Copi, Carl Cohen, and Kenneth McMahon, *Introduction to Logic*.

E. J. Lemmon, *Beginning Logic*.

Hans Halvorson, *How Logic Works: A User's Guide*.

*The role of lectures and textbooks:* No introductory logic text suits all readers. This course does not strictly follow any textbook. In class we won't be able to cover every topic or every detail (due to the limitations of time)—the purpose of lectures is to introduce the key ideas, provide general structures and guidance through the subject, and address questions and confusions. These textbooks are recommended as resources to supplement lectures. The scope and content of assignments and the final exam are set by lectures, rather than any specific textbook. All these books are either posted online or on course reserves and are accessible through the library.

## Classroom Policy

You are strongly encouraged to **take notes in the old-fashioned way, on pen and paper**. Electronic devices are not allowed in class for purposes other than taking notes. It's too distracting for you and others. If you need special accommodations to use electronic devices like laptops for note-taking, please consult the instructor.

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.

## Office Hours and Email Guide

Please feel free to drop in any time during regular office hours. If you'd like to notify me earlier, you can also make an appointment (or see if other people have made an appointment during that time) via the link on the course website.

It is very difficult to discuss logic or other philosophical topics by email, it's recommended to ask them in office hours, during or after class. If you have a logistical question about the course, the best way is to post it on Moodle (under 'Discussion' \_ 'Logistic Questions'). Given the large amount of emails that I receive, I may not be able to get back to you immediately. In the case of something urgent you'd like me to address, please include "urgent" in the email subject. If you don't hear from me more than 5 business days, please feel free to send a reminder.

## Requirements and Assessments

Learning logic is like learning math or physics. It takes practice through time. It is very difficult to grasp everything in a short period of time (say, right before the exams). The following requirements are thus designed to motivate you to make gradual progress and help you stay on track throughout the semester.

### 1. Participation

One of the most important aspects of this course is your participation: asking and answering questions in class as well as engaging in group discussions. This is a way for you to actively engage with the class, instead of being merely recipients of information. It helps to develop your ability to think critically, to reflect and obtain a better understanding of the issues on hand, and to receive interactive guidance on your learning. **Mere attendance is NOT participation.** To motivate and encourage your participation, you can earn 0.5 points for participation in each session. If public speaking really isn't your thing, you can also ask me questions during the break or right after class.

### 2. Lecture Notes

To motivate and encourage you take notes in the old-fashioned way, on pen and paper, you are expected to submit and share your notes for at least two sessions. You can earn 2 points for each submission. Please sign up, during the first week of class, to indicate which sessions you will cover, and plan ahead to ensure you will not miss class on those days. If you can't attend the session that you signed up for due to unexpected reasons, please coordinate with your classmates to see if you can swap your sessions.

**\*Extra credits:** You can earn 3 additional points if you submit and share your notes consistently throughout the semester.

### 3. Weekly Assignments

In a course like this it is essential to do lots of problems (even if you feel like you understand the material on the basis of the lectures and readings). There will be 9 assignments starting from Week 2. Each assignment is worth 5 points.

You should work on these questions independently. You can discuss the assignments with classmates, preceptors or me, but you should NOT just get the answers. Since these exercises are part of your final grade, they are subject to cheating and plagiarism rules. Also, doing your own assignments is how you learn and prepare for exams. Please submit via Moodle before the deadline, and bring the physical copy of your assignment to class next day.

### 4. Weekly Help Sessions/Study Groups

In addition to participating in class, you are expected to attend weekly help sessions/study groups, where you can discuss course materials and assignments with preceptors and other students. This is meant to provide an opportunity for you to learn together with others and receive support. Even if you don't think you need help, it is still valuable to practice explaining things to others (one of the best ways to reinforce and test your own understanding). To receive full credit for this part, you need to attend a minimum of 10 sessions. Preceptors will take attendance.

*Alternative plan:* If study groups really aren't your thing, you may choose to opt out partially or entirely. If you opt out entirely, then your Final Exam will be worth 25% of your grade (instead of 20%). If you opt out partially, you are expected to attend at least 6 sessions, and your Final Exam will be worth 22%.

### 5. Progress Reflection

To help you keep track of your progress in the course and reflect on any adjustments for the remainder of the semester, you will be expected to submit a Progress Reflection twice: once in the middle of the semester (worth 1 point) and again near the end of the semester (worth 0.5 points). The template will be posted on Moodle.

### 6. In-class Exercises and Final Exam

To help you stay on track throughout the semester and prepare you for the final exam, there will be two In-class Exercises. They will be closed-book, with one page of notes allowed. They are designed to

allow you to check how well you're doing in the course. We will discuss the format and expectations for the In-class Exercises and the final exam in more detail during class.

### ***Grading breakdown***

Participation in class		$0.5 \times 19 = 9.5$
Lecture notes		$2 \times 2 = 4$
Weekly Assignments	Wednesdays	$5 \times 9 = 45$
Study Groups		$0.5 \times 10 = 5$
Progress Reflection	After Fall break; after Thanksgiving	$1 + 0.5 = 1.5$
In-class Exercise 1	October 9 or 14	5
In-class Exercise 2	November 18	10
Final Exam	December 9	20
Total		100

### ***Grading Scale***

	A: 93	A-: 90
B+: 87	B: 83	B-: 80
C+: 77	C: 73	C-: 70
D+: 67	D: 63	D-: 60

\*Numeric grades like 92.5 will be rounded up to A if and only if students show either excellent participation or significant improvements through the term.

### ***Late Policy***

Logic is cumulative so falling behind impedes your comprehension. Submitting homework late can also be difficult for your preceptor. We appreciate your consideration regarding this. Usually late work is worth 10% fewer points for every day it is late from the time it was due, unless you have a compelling reason for turning it in late (for instance, you were sick, had to work late, or had to take care of someone else). In order to give you full credit for your late work, please contact me or your preceptor as soon as possible.

### Topics (*subject to revision*)

- Introduction
- Arguments: premises and conclusion
- Truth, Validity, and Soundness
- Deduction vs Induction
- Fallacies
- Conjunction and Disjunction
- Negation
- Truth tables
- Conditionals and Biconditionals
- Logical equivalence
- Sentential logic vs Predicate logic
- Syntax vs Semantics
- Universal quantifier and Existential quantifier
- Probability

### Academic Integrity

Students in this course will be expected to comply with the [Macalester's Policy on Academic Integrity](#). Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, and Students found guilty are subject to disciplinary action, as outlined in the guidelines on Academic Integrity. Furthermore, no student may bring any unauthorized materials to an exam. To learn more about Academic Integrity, visit the [Academic Integrity Guide](#) for an overview of the topic.

### Other Resources and Policy Statements

#### Disability Resources and Services

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and [Center for Disability Resources](#), (651)-696-6748,

[disabilityresources@macalester.edu](mailto:disabilityresources@macalester.edu), as early as possible in the term. The center will verify and determine reasonable accommodations for this course.

## Diversity and Inclusion

Macalester College is committed to creating an accessible and inclusive environment that supports and serves our community members, and does not discriminate based on factors as stated in the Title IX policy. For more information about policies, procedures, and practices, see: <https://www.macalester.edu/title-ix/sexualmisconductpolicy/>.

The assignments and exams will be graded anonymously to ensure fairness and to avoid biases. The reason to grade anonymously is to eliminate the possible effects of implicit biases. For an introduction to implicit bias, take Project Implicit's "Implicit Association Test" (<https://implicit.harvard.edu/implicit>) or read the Stanford Encyclopedia of Philosophy's article on Implicit Bias (<https://plato.stanford.edu/entries/implicit-bias/>).

## Health Resources and Policy

Your health is a priority. Please take care of yourself by staying hydrated, eating well, exercising, getting enough sleep, and taking time to relax. There are many other wonderful people at Macalester and in our broader community who can also help with specific aspects of your mental and physical health. Some of them are listed here: <https://docs.google.com/document/d/1IhoiGs6iUgX-htD64jf60CqbfVE1lp9JhVNlnm6iNsA/preview?pli=1>.

An important part of the college experience is learning how to ask for help. Take the time to learn about all that's available and take advantage of it. Ask for support sooner rather than later—this always helps. If you or anyone you know experiences any academic stress, difficult life events, or difficult feelings like anxiety or depression, we strongly encourage you to seek support. Consider reaching out to a friend, faculty or family member you trust for assistance connecting to the support that can help.

**Illness Policy:** If you are experiencing cold/flu/COVID symptoms, please do not come to class, even if you test negative for COVID. If you test positive for COVID, do not come to class until it has been at least 5 days *and* you are testing negative. The participation credit is designed so that missing one or two classes is fine. If you need to miss more than that, just email me to let me know what's going on.

If you find out you were exposed to COVID, wear a mask in class until you are able to test. If you had a lot of exposure (e.g., your roommate or significant other tested positive), wear a mask in class for at least 3 days after the exposure.