

# SYMBOLIC LOGIC

## FALL SEMESTER 2017

## ROCHESTER INSTITUTE OF TECHNOLOGY

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Office Hours:  
MWF 12:15-1:15  
or by appointment

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### Course Description

This course covers the basic rules of good reasoning. By studying logic we sharpen our ability to reason things through, to see the logical implications of our beliefs, and to distinguish good reasoning from bad. Logic is both useful as well as intellectually rewarding: it illuminates our rational nature as well as the often surprising connections among our beliefs. In this course we will learn a symbolic notation that allows us to express these connections with great efficiency and elegance. (That's what makes this a course in *symbolic* logic.) In many ways this is like learning a new language: one might even think of it as the language of thought. In other ways this is like learning a game with specific goals and objectives.

Logic is about reasoning from particular **premises** (or evidence) to a particular **conclusion**. This chain of reasoning is an **argument**, and logic helps us determine whether a given argument is good or bad. We will focus primarily on **deductive** logic which tells us whether a conclusion **necessarily** follows from certain premises. In a deductive argument, true premises guarantee the truth of the conclusion (i.e., they don't merely make it probably). It is often easier to assess a deductive argument if we translate it into symbolic notation. By doing so we can more easily recognize the logical connections between premises and conclusions.

Because it studies the abstract relations among statements, logic helps us think theoretically. This is a useful skill in a number of areas: law, medicine, and computer programming, to name a few. In addition, it is helpful in taking standardized tests, such as the LSAT and GRE. But logic is also philosophically interesting since it suggests that good arguments follow certain rules, regardless of topic. Because these rules hold true for everyone, everywhere, they help us better understand the nature of rational thought—or at least one type of rational thought.

This logic course is unlike most other philosophy courses and many other logic courses. For one thing, much of the time there will be clear right and wrong answers: things will be much more black-and-white than in most philosophy courses. (This can be a good or a bad thing. Here, it is mostly good.) As a result, most logic courses around the world have the flavor of a mathematics course. However, while this course will cover the standard logical topics it will be different by also including more philosophy of logic. This means that, in addition to learning a system of deductive logic, we'll also discuss the philosophical and historical implications of logic and logical reasoning.

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## Texts

There are two texts for this class. Both are .pdfs you can download from myCourses.

The first is *forallX* (Cambridge). This is an open access logic textbook. We'll be using the version modified by Tim Button.

The second is a collection of articles and book chapters dealing with various philosophical aspects of logic.

It's an excellent idea to print out both of these .pdfs. You can print for free at many ITS supported labs.

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## Expectations

Belaboring the obvious

1. Logic requires a healthy work ethic. It is especially important that we not fall behind: it is so much easier to stay on schedule than try to catch up. Attendance, of course, is mandatory.
2. Logical thinking is a skill. Like all skills, we develop proficiency through practice and exercise; the more we practice, the easier and more natural logic becomes.
3. Get help quickly if you ever feel confused. Because the material in this course is cumulative, it is hard to recover if you fall behind. On the other hand, new material is easier to absorb if you are already comfortable with previous material. Feel free to come to my office or send me an e-mail if you ever have any questions or problems.

- Quizzes
4. Every week or so there will be a short (10-15 minute) quiz on recent material. These quizzes will allow us to keep track of our progress. There will also be an opportunity to retake 2 quizzes on the last day of class. There is no final exam.
- Homework
5. There will be periodic homework assignments (aka “practice exercises”) though I do not plan on collecting these. But please do complete the homework! Not only are these (sometimes) fun puzzles but they really do prepare you for the quizzes and later work. We will often go over the homework in class; I will also periodically set aside time to workshop any questions about the homework.
- If I begin to sense that homework is not being done with the earnestness and diligence it deserves, then I may feel compelled to collect and grade it. I’d rather not do that, obviously.
- Attendance and Participation
6. Attendance is, of course, entirely expected and participation is strongly encouraged. Attendance and participation will count for 20% of the final grade.
- Grading Scale
7. There will be 10 quizzes. These quizzes will cover both the material in *forallX* and the philosophical articles we’ll be reading. Each quiz is worth 20 points. Attendance and participation is worth 50 points for a total of 250 points (quiz points + attendance and participation). It’s possible that I’ll include extra credit on some of the quizzes or devise extra credit assignments later in the semester.
- I will follow a standard grading scale where A=93% or greater, A-=90-92%, B+=88%-89% and so on.
- Additional Information
8. Because I think logic and philosophy are really wonderful and important I’m always happy to talk about the course. Feel free to drop by my office hours or speak to me after class. I’ve found it’s usually a lot more efficient to talk in person than over e-mail.
9. Feel free to ask if you have a question about your grade. While I expect you’re able to keep track of this, too, I’m happy to tell you where you stand if you have any concerns. I generally avoid myCourses in the conviction that we don’t need another barrier to more direct forms of communication.
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## Readings and Assignments

Please note: a particular day's reading and assignment should be done *before* class.

	Reading	Homework
08.28.17	Introductory Remarks	
08.30.17	Shenefelt & White: "Symbolic Logic and The Digital Future" (205-219)	
09.01.17	<i>forallX</i> Section 1	1: 1-4
09.04.17	No Class: Labor Day	
09.06.17	<i>forallX</i> Sections 2-3	2: A-B
	Shenefelt & White: "Symbolic Logic and The Digital Future" (219-234)	3: A-C
09.08.17	<i>forallX</i> Section 4	Quiz #1
09.11.17	<i>forallX</i> Section 5	5: A, B, C (odds), F, G
09.13.17	<i>forallX</i> Section 6	6: A-C
09.15.17	<i>forallX</i> Section 7	Quiz #2
09.18.17	Read: "Truth, Pure and Simple"	
09.20.17	<i>forallX</i> Sections 8-9	
09.22.17	<i>forallX</i> Sections 10-11	10: A (odds) 11: A (odds), B 1, C 1, 3, 5
09.25.17	<i>forallX</i> Sections 12-13	12: A (odds), 13: C Quiz #3
09.27.17	Taylor: "Fatalism"	
09.29.17	<i>forallX</i> Section 14	Quiz #4
10.02.17	<i>forallX</i> Section 15	15: A-B
10.04.17	Ryle: "It Was to Be"	
10.06.17	<i>forallX</i> Section 16	16: A (odds), C (evens)
10.09.17	No Class: Columbus Day	
10.11.17	Haack: "Nothing Fancy: Some Simple Truths about Truth in the Law"	Quiz #5
10.13.17	<i>forallX</i> Section 17	17: A
10.16.17	<i>forallX</i> Section 18	18: A (evens), B 1-4, C 1-2
10.18.17	Mid-Semester Review Day	
10.20.17	No Class	
10.23.17	Maddy: "A Second Philosophy of Logic"	
10.25.17	<i>forallX</i> Section 19	19: A Quiz #6
10.27.17	<i>forallX</i> Sections 20-21	21: A (evens), B

10.30.17	<i>forallX</i> Sections 22-23	23: A 1-3, B 1, 9, C 1, D (odds)
11.01.17	Haack, "Some Metaphysical and Epistemological Questions About Logic"	
11.03.17	<i>forallX</i> Section 24	Quiz #7
11.06.17	<i>forallX</i> Sections 25-26	26: A, B
11.08.17	<i>forallX</i> Section 26	26: C
11.10.17	McGee: "A Counterexample to Modus Ponens"	
11.13.17	<i>forallX</i> Section 27	27: A, B Quiz #8
11.15.17	Wittgenstein: "Remarks on the Foundations of Mathematics" (selections)	
11.17.17	<i>forallX</i> Sections 28-30	28: A, D; 30: A
11.20.17	<i>forallX</i> Section 31	31: A, B, E (odds), H 1-2
11.22.17	No Class: Thanksgiving Break	
11.24.17	No Class: Thanksgiving Break	
11.27.17	Maddy: "The Philosophy of Logic"	
11.29.17	<i>forallX</i> Sections 32-33	32: B, C 3; 33: B
12.01.17	<i>forallX</i> Sections 34-35	Quiz #9
12.04.17	Button: "Soundness"	
12.06.17	Zach et al.: "The Completeness Theorem"	Quiz #10
12.08.17	Shenefelt & White: "Faith and the Limits of Logic"	
12.11.17	Make-up Quizzes	