

SYLLABUS FOR PHILOSOPHY 207: INTRODUCTION TO LOGIC

Instructor	Course Info
Peter R. Murray	Philosophy 207
OH: Mon., Tues. 10am–12am	Tues, Thurs 12:40pm–2:00pm
Ladd 215, 518-580-5401	Ladd 107
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Course Description

You are already much more familiar with logic than you might think. For example, if all Republican candidates for President oppose federal funding for Planned Parenthood, and if opposing federal funding for Planned Parenthood is opposing reproductive healthcare for low-income women, then what must be true of all Republican candidates for President? Or suppose a child's parents tell him at dinner, "here's the deal: you won't get dessert if you don't eat your peas," but then they don't give him dessert after he eats his peas. Granted that they are jerks, did the parents break the deal? Or suppose you and some of your logician friends walk into a bar, the bartender asks you, "Do you all want a beer?", and the logicians each answer, "I don't know." If you want a beer, why would you be right to then answer, "Yes! We all want a beer!", to the bartender? See? In answering these questions, you are using logic! You are working through the implications for whether a statement must—or must not, or need not—be true or false, given the truth (or falsity) of other statements.

In this course, we will learn the basic concepts and methods of modern symbolic logic, particularly as they relate to deductive reasoning and argumentation. We will learn how to represent sentences of English in logical notation, to reconstruct arguments in that notation, and to assess those arguments for validity and soundness. We will also learn how to prove conclusions from premises using the rules of a system of natural deduction. Along the way, we will come to recognize common argument forms and common mistakes in reasoning (fallacies), we will discuss some of the philosophical issues related to logic, and we will learn everything you never thought you wanted to know about love, logically speaking.

As you will see, learning logic can be enormously useful in many aspects of your life both at Skidmore and beyond. It will help you recognize and understand the arguments for, and the assumptions behind, various positions and views you encounter. It will help you to present an author's position persuasively and to know how to critique it. And it will help you make compelling, reasoned arguments for your own positions, whether in a philosophy class, another course at Skidmore, or elsewhere in life. Other benefits may include: a head start on a computer science career, since symbolic logic is the basis for everything that goes on in a computer; a dominating performance on your law school LSAT; clearer skin; and so much more! This course fulfills the QR2 requirement and is a required course for the Philosophy major.

Course Learning Objectives

The ability to understand, analyze, evaluate, and critique the reasoning and argumentation we encounter in the world, and that we present in support of our own conclusions, is an important

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skill. It is part of what allows us to see alternatives to given proposals, whether inside or outside the classroom, and it is essential to thinking creatively and successfully about solutions to the problems we face in the world. It is also a skill at which we become more competent through training and practice, which is just what a course in logic such as this one provides. Accordingly, the main objective of this class is to give you that training, and for you to practice and develop that skill. In particular, the learning objectives in this course are for you to be able to:

- (1) Recognize and explain basic concepts used in the evaluation of reasoning and argumentation, and to apply them in the evaluation of arguments;
- (2) Represent sentences of English in logical notation, reconstruct arguments in that notation, and evaluate those arguments;
- (3) Recognize common argument forms and common mistakes in reasoning, and to prove conclusions from premises using the rules of a system of natural deduction.

Course Materials

Logic and Philosophy: A Modern Introduction, 11th ed. (by Hausman, Tidman, and Kahane)

See the course *Blackboard* site for other materials we will be working with in this class.

Course Requirements

There are 100 possible points in this course. Your final grade in this course is determined by your participation in class and your scores on homework assignments, peer grading, and tests:

1. Participation (worth 10 points, 10% of course grade)

To participate successfully in this class, you must:

- Read the assigned texts before class, think about them, and bring them to class;
- Come to class consistently and on time (I keep track of attendance). *In addition, students who miss more than six classes, for whatever reason, will fail the course;*
- Participate actively in class discussions and activities (I note down who participates);
- Bring questions to office hours, post questions or other issues for discussion to the Support Forum section of the course *Blackboard* site, and/or respond to questions and issues that other students have posted to the Support Forum.

2. Homework (worth 30 points, 30% of course grade)

- There are homework assignments due in 18 classes of this course. Your three lowest homework grades will not count. Homework assignments are due at the beginning of class on the day indicated in the course schedule, and no late or partially completed assignments will be accepted.

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- For each exercise, you should do only the odd-numbered problems up to number 9 (So, you should do a maximum of five problems per exercise).
- You may either type or handwrite your homework. Please see the Course Resources page of the course *Blackboard* site for instructions on how to insert logical symbols in Microsoft Word. Your Skidmore Student ID number should be the only identifying information on your homework. Please staple your homework pages together.

3. Peer-Grading of Homework (worth 10 points, 10% of course grade)

- Homework is peer-graded on a ✓, ✓+, ✓- (check, check-plus, check-minus) basis. I will explain how peer grading and the check system work on the first day of class. See the “Guidelines for Peer Homework Grading and the Check System” on the Course Resources page of the course *Blackboard* site for details.
- To get your points for a given homework assignment, you need to grade a peer’s homework assignment and turn it back in to me. Your grading of your peers’ homework assignments is worth ten points (10% of your course grade). If you do all the grading that is assigned to you for the course, you receive the full ten points. For every grading assignment you do not complete, one point will be deducted from your grading point total, and you will not receive points for your own homework assignment. So, you will not receive a total of three points per grading assignment that you do not complete.

4. Tests (worth 50 points, 50% of course grade)

- There will be six tests in this course, one at the end of each major unit. The lowest of your six test scores may be thrown out, subject to the conditions below. The five remaining tests will count for ten points each (10% of your course grade).
- You must take and make a good-faith effort to complete all six tests to be eligible to throw out your lowest test score. Test scores below 60 may not be thrown out, nor may the score on the final test be thrown out.

5. Academic Integrity

- Your work in this course is governed by the Skidmore College Honor Code and Code of Conduct (https://www.skidmore.edu/student_handbook/honor-code.php).
- Violations of the Honor Code and/or Code of Conduct will result in your failing this course. If you have any questions regarding whether particular actions constitute violations of the Honor Code or Code of Conduct, please see me to discuss them.

Final course grades are determined according to the following scale:

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

Skidmore College has a variety of resources available to support your work in this and other courses. Please seek them out and let me know if you have any questions about them. An online listing of available resources is at <https://www.skidmore.edu/advising/support.php>. I have already contacted Student Academic Services about arranging a peer tutor for this course, and I will let you know if we are able to identify someone who can fill that role.

Skidmore is also committed to supporting your mental health and wellbeing. If you—like many college students—are experiencing depression or anxiety, suffering from an eating disorder, struggling with some other psychological difficulty or trauma, or if you just need someone with whom to talk, the Counseling Center is an excellent place to get the help you need. More information is available online at <https://www.skidmore.edu/counseling/services.php>. If you need immediate assistance at any time of the day or night, call Campus Safety at 518-580-5567, and they can connect you with the counselor on call.

Furthermore, Skidmore College is committed to providing a learning, working, and living environment that reflects and promotes personal integrity, civility, and mutual respect. We have the right to be free from all forms of abuse, assault, harassment, and coercive conduct, including sexual and gender-based misconduct. Skidmore College considers sexual and gender-based misconduct to be one of the most serious violations of the values and standards of the College. Unwelcome sexual contact of any form is a violation of our personal integrity and our right to a safe environment and violates Skidmore's values. Skidmore College will not tolerate sexual or gender-based misconduct in any form. Sexual and gender-based misconduct is also prohibited by federal Title IX regulations.

I, like the rest of the Skidmore College faculty, am committed to supporting you and upholding gender equity laws as outlined by Title IX. Therefore, you should know that, if you choose to confide in me or another member of Skidmore's faculty or staff regarding an occurrence of sexual or gender-based misconduct, we are obligated to tell Skidmore's Title IX Deputy Coordinator. The Title IX Deputy Coordinator will assist you in connecting with all possible resources for support and reporting both on and off campus. If you wish to report or discuss an occurrence of sexual or gender-based misconduct confidentially or anonymously, I can help direct you to the appropriate resources on campus where you can do that.

If you are a student with a disability and you require academic accommodations for this course, please contact the Coordinator of Student Access Services (Meg Hegener, 518-580-8150, mhegener@skidmore.edu) to arrange your accommodations.

Strategies for Success

Logic is one of those subjects that builds systematically from class meeting to class meeting and from topic to topic. So, it is hard to understand what comes later in the course, if you haven't understood what came before it. It is also difficult to catch up once you've fallen behind. So, I

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encourage you to contact me as soon as you feel you are not understanding or keeping up with the class material. We can then schedule an appointment and get you back on track.

Learning logic takes time and practice, and there are, unfortunately, no shortcuts. You should be prepared to spend at least two hours on reading and homework for every hour we spend in class (So, that's at least six hours per week outside of class). Coming to class prepared with questions about what you found difficult to understand in the reading and homework for that day is an important part of making steady progress and not falling behind.

The answers to the even-numbered problems are in the back of your textbook. I recommend doing at least three of the even-numbered problems in each exercise and checking your work against the answers in the back of the book to make sure you are getting it. Many people also find flash cards useful for memorizing the definition of key concepts and terms, e.g., validity, soundness, necessity, consistency, etc.

Though each student is required to do his or her own work, I highly encourage you to work on the homework in pairs or groups. Often, a breakthrough in your own understanding of the material is as close as another student working on the same problem. Also, please do come to my office hours to talk through any difficulties you are having with the course material. I've been where you are, and I am here and want to help. The week of 11/3–11/5, we're going to have instructor-student midterm status meetings in my office hours to make sure we're all on the same page regarding how you're doing in the course, and I encourage you to fill out the Instructor Feedback Form that is linked from the course *Blackboard* site to let me know how I can help you better.

Recent scientific studies show that multitasking, e.g., checking email or texting in class or while doing homework, makes us dramatically less productive, leads to problems with concentration, organization, and attention to detail, and is associated with short-term drops in IQ of up to fifteen points (Ophir, Nass, and Wagner (2009). "Cognitive control in media multitaskers". *Proceedings of the National Academy of Sciences*, September 15, 2009, vol. 106 no. 37, 15583-15587; http://news.bbc.co.uk/2/hi/uk_news/4471607.stm). A single-tasking technique that I recommend is to work in 25-minute units, during which you do only one thing, e.g., your logic homework, with a 5-minute break between units to do whatever you want (eventually you can work up to 45-minute units, with 15-minute breaks between units). I also recommend that you set a timer to keep track of your units and breaks and that you use an internet blocker like Freedom to help keep distractions at bay while you're doing a unit. See the Course Resources page of the course *Blackboard* site for links to various apps and services that you might find helpful to help you focus and be more productive.

A final, related note on using computers and other technology in class: There is a burgeoning body evidence to suggest that using computers or other devices to take notes in class, rather than writing notes by hand, leads to decreased retention of course material and poorer performance on tests (Mueller and Oppenheimer (2014). "The Pen Is Mightier Than the Keyboard: Advantages of Longhand Over Laptop Note Taking". *Psychological Science*, June 2014, vol. 25 no. 6, 1159-1168). However, I have generally taken my class notes on a computer,

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and I will allow you to do so in this class, subject to the following condition: you may only use your computer or other technology in class to take notes. Students who check email, text, or surf the internet during class are not only doing themselves a disservice, their activities are highly distracting to those around them, and I have a responsibility to maintain a learning-conducive environment in my classroom. Using an internet blocker like Freedom during class time can be highly effective for avoiding temptation.

Course Schedule (subject to revision)

[iCalendar link for assignments available on the course *Blackboard* site]

Unit	Topic	Reading for Class	Assignment Due
Introduction, Basic Concepts	9/10: Introduction to the course, syllabus, puzzles	In-class handouts	None
	9/15: deductive vs. inductive arguments, argument form, validity, soundness	<i>LP</i> Ch. 1 pp. 1-11	Exercises 1-1, 1-2
	9/17: consistency and validity, contexts of discovery and justification	<i>LP</i> Ch. 1 pp. 12-16	Exercise 1-3
	BASIC CONCEPTS TEST		
Sentential Logic Symbolization	9/22: atomic and compound sentences, variables and constants, truth functions, truth-functional connectives (conjunction, negation), parentheses and brackets	<i>LP</i> Ch. 2 pp. 18-30	Exercises 2-1, 2-2
	9/24: Truth-functional connectives (disjunction, material conditional and biconditional), not both, neither nor, unless, only if	<i>LP</i> Ch. 2 pp. 30-41	Exercises 2-3, 2-4, 2-5
	9/29: complex sentences	<i>LP</i> Ch. 2 pp.41-8	Exercises 2-6, 2-7, 2-8
	10/1: SENTENTIAL LOGIC SYMBOLIZATION TEST		

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Truth-Table Method	10/6: logical form, tautologies, contradictions, contingent sentences, computer logic gates	<i>LP</i> Ch. 3 pp. 53-68	Exercises 3-1, 3-5 3-6, 3-7
	10/8: logical equivalence, truth-table tests for validity and consistency, short truth-table tests for invalidity and consistency	<i>LP</i> Ch. 3 pp.69-80	Exercises 3-8, 3-9 3-10, 3-11
	10/13: TRUTH-TABLE METHOD TEST		
Sentential Logic Proofs	10/15: Argument forms, implicational rules of inference (modus ponens, modus tollens, disjunctive syllogism, hypothetical syllogism, simplification, conjunction, addition, constructive dilemma)	<i>LP</i> Ch. 4 pp. 86-103	Exercises 4-1, 4-2 4-3, 4-5
	10/20: equivalence rules of inference (double negation, DeMorgan's, commutation, association, distribution, contraposition, implication, exportation)	<i>LP</i> Ch. 4 pp. 103-20	Exercises 4-6, 4-8, 4-9, 4-12
	10/22: conditional proofs	<i>LP</i> Ch. 5 pp. 123-32	Exercises 5-1, 5-2
	10/27: Indirect proofs	<i>LP</i> Ch. 5 pp. 132-40	Exercises 5-3, 5-5, 5-6, 5-7
	10/29: extra day on sentential logic proofs		
	Sign up for Instructor-Student Midterm Status Meetings in Office Hours week of 11/3–11/5		
	11/3: SENTENTIAL LOGIC PROOFS TEST		
	11/5: Review of Sentential Logic Proofs test		
Predicate Logic Symbolization	11/10: Individuals, properties, and quantifiers (universal, existential)	<i>LP</i> Ch. 7 pp. 167-78	Exercises 7-1, 7-3, 7-4, 7-5
	11/12: square of opposition, basic symbolizations and common mistakes	<i>LP</i> Ch. 7 pp. 178-89	Exercises 7-6, 7-7 7-9, 7-10
	Extra day on predicate logic symbolization		

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	11/19: PREDICATE LOGIC SYMBOLIZATION TEST		
Predicate Logic Proofs	11/24: four quantifier rules (universal instantiation, universal generalization, existential instantiation, existential generalization), five restrictions quantifier rules	<i>LP</i> Ch. 9 pp. 200-15	Exercises 9-1, 9-2
	12/1: mastering the quantifier rules, quantifier negation	<i>LP</i> Ch. 9 pp. 216-25	Exercises 9-3, 9-4, 9-5
	12/3: relational predicates, overlapping quantifiers, places, times, somewhere, someone	<i>LP</i> Ch. 10 pp. 226-40	Exercises 10-1, 10-3, 10-4, 10-5
	12/8: relational logic proofs	<i>LP</i> Ch. 10 pp. 240-50	Exercises 10-7, 10-9, 10-10, 10-11
	12/10: extra day on predicate logic proofs		
	12/17: PREDICATE LOGIC PROOFS TEST (6:00pm-9:00pm)		