PHIL 12: LOGIC, Section B

Fall 2021

Professor
Alan Baker
Office: Beardsley 211C
Phone: 8342
email: abaker1@swarthmore.edu

Schedule
Mon, Wed, Fri 11:30am – 12:20pm
Kohlberg 115

Office Hours (*by appointment*) Mon 1:30 – 2:30pm; Thu 1:30 – 2:30pm
If you wish to meet with me for office hours, please email me in advance to schedule a specific time slot.

TA's:	Megan Wu	David Yang
email:	mwu1	dyang5

TA Sessions: Wed 8 – 10pm, Sun 8 – 10pm, Science Center Commons

Prerequisites
At least one introductory course in philosophy. Freshmen may take this course without meeting this prerequisite, and are encouraged to choose Phil 12B rather than Phil 12A if they intend to major or minor in philosophy.

Course Description
The primary goal of this course is to develop familiarity with, and understanding of, the basics of sentential and quantificational logic. These formal systems provide powerful tools for translating arguments from natural languages (such as English) into symbols, and for constructing rigorous proofs using these symbols together with specially formulated rules of deduction. Both the syntactic and semantic apparatus of each formal system will be developed.

A secondary goal is the examination and discussion of selected philosophical issues surrounding the results, techniques, and presuppositions of logic. Supporting materials for this component of the course include readings by philosophers of logic.

Assessment

Homework problem sets	[9 x 3%]	27%
In-class exams	[2 x 12%]	24%
Take-home exams	[2 x 10%]	20%
Final exam		24%
Attendance / Participation		5%

Readings
The textbook for the course is *Elementary Symbolic Logic*, by W. Gustason and D. Ulrich (2nd ed., 1989). Weekly assigned philosophical readings will be available electronically on the Moodle site for this course.

Organization
Typically the formal logic will be done on Monday and Wednesday, with philosophical discussion of readings taking place on Friday. Homework problem sets will normally be set in the second half of the week and be due in class the following Monday.

Attendance / Participation
Regular class attendance is expected. Part of the final grade is based on attendance and participation, and there are also several in-class exams and other assessment components. For the Friday readings, I will expect you to have done the reading in advance and to bring a hard copy of the assigned reading with you to class. Please email me, preferably in advance, if you need to miss a class.

Electronics
Taking notes and writing proofs in formal logic is much easier to do with pen and paper rather than on a laptop or other electronic device. I therefore request that all phones, tablets, and laptops be turned off and remain out of sight during class. If there are special circumstances that make this problematic for you, please contact me and I will consider your individual case.

Plagiarism
Some consultation with TA's and with other students in the class is allowed on the weekly homework assignments, but the final answers you submit should be your own work. No outside help is allowed on the take-home exams.

Provisional Schedule

Week 1 The Nature and Scope of Logic 8 / 30

GU §1.1, 1.5

Friday topic: What is logic?
Reading: Quine, W. (1950) 'Introduction,' from *Methods of Logic*

Week 2 Translation 9 / 6 no class [Labor Day]
Homework 1 due 9 / 8

GU §1.2, 1.3, 1.4

Friday topic: What structural features make arguments good?
Reading: Baker, A. (2013) 'Valid and Invalid Argument Forms.'

Week 3	Sentential Logic: Truth Tables	**Homework 2 due**	9 / 13
	GU §2.1, 2.2, 2.3(i)		
Friday topic:	What is knowledge?		
Reading:	Gettier, "Is Justified True Belief Knowledge?"		
Week 4	Sentential Logic: Formal Semantics	**Homework 3 due**	9 / 20
	GU §2.3(ii), 2.4, 2.5		
	First Exam (in-class)		9 / 24
Week 5	Sentential Logic: Rules of Deduction		9 / 27
	GU §3.1		
Friday topic:	What gives logical connectives their meaning?		
Readings:	Prior, A. (1960) 'The Runabout Inference-Ticket,' *Analysis*, vol. 21 Belnap, N. (1962) 'Tonk, Plonk and Plink,' *Analysis*, vol. 22		
Week 6	Sentential Logic: Further Deductive Methods	**Homework 4 due**	10 / 4
	GU §3.2, 3.3(i)		
Friday topic:	On what grounds should we expect observed patterns to continue?		
Reading:	Baker, A. (2004) 'Countering Counterinduction'		
FALL BREAK			
Week 7	Sentential Logic: Conditional Proof and Indirect Proof	**Homework 5 due**	10 / 18
	GU §3.3(ii), 3.4		
Friday topic:	What is the status of proofs by *reductio ad absurdum*?		
Reading:	Brown, J. (2008) 'Constructive Approaches,' *Philosophy of Mathematics*, Chapter 8		
	Second Exam (take-home)		10 / 22
Week 8	Metatheory	**Second Exam due**	10 / 25
	GU §4.1, 4.2		

Friday topic: How can the concepts of necessity and possibility be treated within logic?
Reading: Girle, R. (2000) 'A Simple Modal Logic,' in *Modal Logic and Philosophy*

Week 9	Quantificational Logic: Translation	**Homework 6 due**	11 / 1
	GU §5.1, 5.2		

Friday topic: Can the existence of God be proved using logic?
Readings: Sobel, J. (2004) 'Classical Ontological Arguments,' from *Logic & Theism*
Baker, A. (2013) 'The Devil Argument.'

Week 10	Quantificational Logic: Identity	**Homework 7 due**	11 / 8
	GU §5.2(cont.), 5.3		
	Third Exam (in-class)		11 / 12
Week 11	Quantificational Logic: Rules of Deduction		11 / 15
	GU §7.1, 7.2		
Week 12	Quantificational Logic: Strategies for Proof	**Homework 8 due**	11 / 22
	GU §7.3, 7.4		
	Fourth Exam (take-home)		11 / 24

THANKSGIVING BREAK

Week 13	Quantificational Logic: Semantics	**Fourth Exam due**	11 / 29
	GU §6.1, 6.2		

Friday topic: What should be included in the catalog of what exists?
Reading: Quine, "The Web of Belief"

Week 14	Review	**Homework 9 due**	12 / 6