

Phil 201, Section 8: Introduction to Logic

1.19.2011

Instructor:	Ben Levinstein
Email:	balevinstein@gmail.com
Time:	MW 18:10-19:30
Place:	Frelinghuysen Hall, B4, CAC
Office:	Seminary 1, B016; map
Office Hours:	Tu 2:30-3:30

Course Description:

When is it rational to infer one claim from others? The discipline of Logic aims to answer this question and others concerning the rich patterns of inference and reasoning that emerge upon further study. Formal Logic approaches these questions using some mathematical techniques that we will meet and begin to master in this course. In particular, we will study a powerful artificial language called First-Order Logic (FOL) that will allow us to precisely formulate the concepts of proof, truth and valid inference. FOL has been of immense foundational importance to mathematics, philosophy, computer science, linguistics and artificial intelligence, and so through FOL we will be encountering ideas of interest to all of these disciplines. Our study of FOL will focus on using it to represent and evaluate the inferences we normally express in ordinary English and other natural languages. Throughout the course we will rely heavily on the interactive computer software included with the textbook to solidify the understanding of logic that can be achieved by studying FOL.

Textbook:

Language, Proof, and Logic by Jon Barwise & John Etchemendy

- **Beware:** You *must* obtain a new copy. The software contains a license that can only be used for one person and cannot be transferred.
- The text has a webpage that will be useful throughout the course: <http://ggww2.stanford.edu>.

Requirements:

- **30%**: Homework and Problem Sets
- **20%**: Midterm 1
- **20%**: Midterm 2
- **30%**: Final Exam

Grading Scale:

Letter Grade	Score
A	90 and above
B+	86-89
B	80-85
C+	75-79
C	70-74
D	65-69
F	0-64

The Biggest Prover:

Throughout the course we will be playing a team-based logic game called The Biggest Prover. The attached handout explains the format and rules of the game. The idea behind it all is that you learn logic first and foremost by working problems of increasing difficulty, while practicing speed and accuracy. There are handsome prizes for success at TBP. See the webpage for more information:

<http://sites.google.com/site/thebiggestprover/>

Class Etiquette & Academic Integrity:

I expect you to behave ethically, at least as pertains to matters in this class. Students are encouraged to ask questions, respond to other students' questions, and raise issues. Everyone is expected to treat others critically but respectfully. Further, I take academic integrity very seriously. **Problem sets, quizzes and exams need to represent your own, original work. Cheating of any kind will be reported to the relevant academic dean, will result in a failing grade on the assignment, and could result in your suspension or expul-**

tion from Rutgers. For more information, see the Rutgers policy: <http://ctaar.rutgers.edu/integrity/policy.html>. If you have any questions about this policy or acceptable collaboration with other students, please contact me.

Tentative Schedule:

Date	HW Due	Reading	Topics
<i>Week 1</i> 1.19			<i>Introduction</i> Introduction
<i>Week 2</i> 1.24 1.26		1.1-1.4 2.1-2	<i>The Concepts of Logic</i> Atomic Sentences & Tarski's World No Class
<i>Week 3</i> 1.31 2.02	HW1	3.1-7 2.1, 4.1-4	<i>Boolean Logic</i> Meet the Booleans: \wedge, \vee, \neg Tautologies, Consequence, & Equivalence
<i>Week 4</i> 2.07 2.09	HW2	2.1-5 6.1-5	<i>Consequence, Proof, Fitch</i> Proofs with Atomics Proofs with Booleans, Subproofs
<i>Week 5</i> 2.14 2.16	HW3	7 (all) 8.1-2, 8.4	<i>Conditionals</i> Intro to conditionals Conditional Proofs
<i>Week 6</i> 2.21 2.23	HW4		<i>Midterm</i> Midterm Review MIDTERM 1
<i>Week 7</i> 2.28 3.02		9.1-3 9.4-6	<i>Intro to Quantification</i> Basics of Quantification Quantification & Translation
<i>Week 8</i> 3.07 3.09	HW5	10 (all) 11.1-3	<i>Logic of Quantification</i> Taut, Con, Equiv Multiple, Mixed Quant's
<i>Week 9</i> 3.14 3.16			<i>Vacation</i> Spring Break Spring Break

Date	HW Due	Reading	Topics
<i>Week 10</i> 3.21 3.23	HW6	11.4-5, 11.8	<i>Translation, Review</i> More Translation Review
<i>Week 11</i> 3.28 3.30	HW7	12.1-2	<i>Midterm, Quant's in Proofs</i> MIDTERM 2 Steps, Existential Instantiation
<i>Week 12</i> 4.04 4.06	HW8	12.3 12.4	<i>More Proofs</i> General Proofs Mixed Proofs
<i>Week 13</i> 4.11 4.13	HW9	13.1 13.2	<i>Still More Proofs</i> \forall rules \exists rules
<i>Week 14</i> 4.18 4.20	HW10	13.3, 13.5 14.1-4	<i>More on Quantification</i> Strategy & Tactics Numerical Quantification
<i>Week 15</i> 4.25 4.27	HW11	14.5-6	<i>Quantification, Review, USOD</i> Determiners & Expressive Limitation Review
<i>Week 16</i> 5.02			<i>Review</i> Review