

INTRODUCTORY LOGIC — PHL 110

Instructor: Yanssel Garcia

Course Description

Logic is the study of consequence; it concerns itself with what can be inferred from what. More specifically, in logic we're concerned with what makes an argument a good argument — what is needed to make a conclusion follow from its premises. In this course, we'll be occupying ourselves with formal logic. This means that we'll be looking specifically at the structure of arguments, learning which types of structures are conducive to truth-preservation, and learning how to test arguments for validity. This will involve learning how to symbolize arguments, construct truth tables, and work through proofs. To this end, we'll be looking at two systems of logic in particular: statement and predicate logic. Both of these systems are artificial languages that aim at mapping more or less what goes on in natural language. In order to avoid things getting too dry, we'll occasionally consider some philosophical issues such as what we're looking for in a good artificial language, what the purpose of such languages is, the effectiveness of the languages we're considering, and whether what we're aiming for has any hope for success.

Grading and Assignments

Classroom attendance isn't required, but it's highly recommended. Not attending the lectures is almost guaranteed to hurt your performance. While just reading the textbook will work for some of what we'll learn, some of what I'll be teaching will differ from the text.

The following is the breakdown for how you'll be evaluated:

Workshop Attendance: 10%
Four Problem Sets: 20%
Midterm Exam: 35%
Final Exam: 35%

Workshops

Unlike classroom attendance, workshop attendance *is required*. You may miss up to two workshops without penalty. Practice is of the utmost importance in this course; the only way to really get this stuff is to work through hundreds of problems time and again. I promise that this can actually be more fun than it sounds. Each workshop will be led by an excellent workshop leader who will guide you through the ungraded problem sets I'll have prepared for you. Workshops guarantee that you'll get at least some of the required exposure to the nitty-gritty in order to succeed. Your success is my primary interest.

Problem Sets

You'll receive four of these throughout the semester. I promise to get them back to you in a timely manner, and we'll dedicate some time to go over whichever problems you struggled with before moving on with the course. I expect these to be turned in to me (either in person or to my mailbox in Lattimore) on time. Every day that they're late, your grade on the assignment will suffer a 10% deduction unless there are extenuating circumstances.

Midterm and Final

This is the bulk of your grade. The final will not be cumulative.

Course Materials

Textbook: *The Power of Logic* by Howard-Snyder, Howard-Snyder, and Wasserman

You can find the latest edition in the bookstore. If the latest edition is too pricey (it is), I recommend getting the Fourth Edition which is much cheaper. There are a few differences, but it's nothing substantive. If that's not accessible, the Third Edition will work as well, though I recommend it less highly. I have also placed the textbook on course reserve in the library.

Academic Honesty

Throughout the semester, you'll be expected to act in accordance with the Academic Honesty Policy. For more information, visit: www.rochester.edu/college/honesty

In accordance with the Academic Honesty Policy, you must also copy and sign the following Honor Pledge on each of your assignments: "I affirm that I have not given or received any unauthorized help on this assignment, and that this work is my own."

Introduction

- Jan 17th — Syllabus and Introduction
Arguments, Inferences, and Propositions
Readings: None
- Jan 22nd — Evaluating Arguments
Deduction, Validity, Soundness, and Fallacious Reasoning
Readings: Ch. 1 Intro; 1.1 - 1.3; Skim Ch. 4

Statement Logic

- Jan 24th — Symbolizing Arguments
Atomic Statements, Connectives, Well-Formed Formulas, and Conditionals
Readings: Ch. 7 Intro; 7.1
- Jan 29th — Truth Tables: Validity
Testing Validity
Readings: 7.2 - 7.3
- Jan 31st — Truth Tables: Tautologies, Contradictions, and Others
Important Categories
Readings: 7.5
- Feb 2nd — **PROBLEM SET 1 DUE**
- Feb 5th — Truth Tables: Abbreviated
Simpler Truth Tables
Readings: 7.4
- Feb 7th — Proofs: Rules of Inference
Rules, Justification, and the Main Connective
Readings: Ch. 8 Intro; 8.1
- Feb 12th — Proofs: Equivalence Rules
Remembering Equivalence and a New Kind of Rule
Readings: 8.2 - 8.3
- Feb 14th — Proofs: Practice
The Nitty-Gritty
Readings: None
- Feb 19th — Proofs: Conditional Proof
Proving Conditionals through Assumption
Readings: 8.4

Feb 21st — Proofs: Reductio ad Absurdum
Proving through Contradiction
Readings: 8.5

Feb 23rd — **PROBLEM SET 2 DUE**

Feb 26th — Proofs: Practice Nesting
Scary Proofs
Readings: None

Feb 28th — Proofs: Theorems
Premiseless Proofs
Readings: 8.6

Mar 5th — Exam Review
A Taste of Mercy

Mar 7th — **Midterm Exam**
You've Got This

Mar 10th-18th — **Spring Break (ENJOY!)**
Woefully Temporary Freedom

Predicate Logic

Mar 19th — Symbolizing Arguments
Predicates, Constants, Variables, and Quantifiers
Readings: Ch. 9 Intro; 9.1

Mar 21st — Symbolizing Arguments Continued
Another Round
Readings: None

Mar 26th — Algorithms
Testing Validity
Readings: 9.2

Mar 28th — Proofs: Universal Instantiation and Existential Generalization
Easy Quantifier Rules and Another Equivalence Rule
Readings: 9.3

Apr 2nd — Proofs: Existential Instantiation
A More Difficult Rule
Readings: 9.3 Continued

PROBLEM SET 3 DUE

Apr 4 th	—	Proofs: Existential Instantiation Continued <i>More Exposure</i> Readings: None
Apr 9 th	—	Proofs: Universal Generalization <i>The Final Quantification Rule</i> Readings: 9.3 - 9.4
Apr 11 th	—	Proofs: Universal Generalization Continued <i>More Exposure</i> Readings: None
Apr 16 th	—	Proofs: Relations <i>N-place Predicates</i> Readings: 9.5 - 9.6
Apr 18 th	—	Proofs: Practice <i>The Nitty-Gritty Revisited</i> Readings: None
PROBLEM SET 4 DUE		
Apr 23 rd	—	Proofs: Identity <i>The Final Rule</i> Readings: 9.7 - 9.8
Apr 25 th	—	Proofs: More Identity <i>Healthy Redundancy</i> Readings: None
Apr 30 th	—	Exam Review <i>A Final Taste of Mercy</i>

May 8th at 8:30am
Final Exam
Dawn of the Final Day