Phil 155: Introduction to Mathematical Logic

Term:	Fall 2012	**Instructor:**	Robert Smithson
Time:	T/R 8-9:15	**Email:**	rhs2z@live.unc.edu
Room:	Caldwell 105	**Office:**	Caldwell 206A
		Office Hours:	W 9:45-11:45 and by appt.

Course Description
We know that some arguments are good and some arguments are bad. But just what is it that makes some arguments good? In general, an argument is good only if its conclusion follows logically from its premises - we call these types of arguments valid. Logic is the formal study of validity. In this class, we will use formal techniques that help us determine in a rigorous way whether or not a given argument is valid. To this end, we will study special formal languages and will learn how to translate between these languages and English. We will begin the course by studying sentential logic and will then move on to study a richer system of quantificational logic. In this class, we will see how evaluating arguments in formal languages can help clarify our everyday patterns of reasoning.

Course Texts:
The text used for this course is "An Introduction to Symbolic Logic" by Terence Parsons. It is available at www.philosophy.ucla.edu/people/faculty/tparsons/Logic%20Text/. The course will cover the first three chapters.

Honor Code
In this class, the Honor Code is taken very seriously and all infractions will be reported to the Honor Council.

Logic 2010
Homework assignments are submitted **online** using UCLA's "Logic 2010" program (http://logiclx.humnet.ucla.edu/). So a working computer with access to the internet is a requirement for this course. Students need to download, install, and register for this program ASAP (see attached document). You will need to know your UNC Student ID number and pick a password when you register with the system. **Students who have not registered for the program after the first three days of class will be dropped from the course.**

Because I will often work through problems in class using the Logic 2010 program, it is **recommended**, but not required, that students bring a laptop to class.

Course Website
There are two websites for this course. The most important website for the course is the Logic 2010 student page: https://logiclx.humnet.ucla.edu/Logic/Student/Course. Students must register for the Logic 2010 program before they can access the Logic 2010 course website. The Logic 2010 website lists the homework assignments and records student grades for those assignments. It also contains a section (under the "Documents" tab) with many helpful documents explaining how to use the Logic 2010 program. The second course website is the UNC Sakai site for this course. The Sakai site will mainly be used for announcements and for posting documents.

Course Requirements
Homework assignments: 20%
Midterm 1: 20%
Midterm 2: 20%
Final: 35%
Class attendance/participation: 5%

Homework
There will typically be 1-2 homework assignments per week, due ten minutes before lecture. Late homework assignments receive no credit unless a valid excuse is communicated (if possible) well in advance of the deadline for the assignment.

Homework assignments can be accessed through the Logic 2010 program (by clicking on the "Assignments" button on the Main Menu) or by signing in to the Logic 2010 student page. Homework assignments must be submitted over the internet to the Logic 2010 database directly from the logic software. Please make sure that your computer is connected to the internet before submitting your assignment. Further instructions for using the program and for submitting homework to the database are available in the attached document and under the "Documents" tab on the Logic 2010 website.

Exams
There will be two midterms and a final. The exams are open-note and open-book. you will **NOT** be able to use the software to take the exams.

Course Schedule:
In the first third of the course (up until the first midterm), we will cover a sentential logic with negation/conditional symbols. The second third of the course (up to the second midterm) will cover an expanded sentential logic with conjunction, disjunction, and biconditional symbols. In the final third of the course, we will study a richer logic with existential and universal quantifiers. Homework assignments will be made available day to day based on how quickly we cover material in class. Midterms will be announced one week in advance.

This schedule is subject to change, depending on the progress of the discussion in the class. If there are changes, I will make note of them in class and will send out an email about the changes. For each class period, there is a listed reading. The reading for 08/21 should be completed before class on 08/21, etc.

Date	**Topic**
T 08/21	**Syllabus, validity, formal languages**
	Reading: None
R 08/23	**A language with negation and conditionals, grammatical trees**
	Reading: Ch. 1, section 1 (1.1)
T 08/28	**Symbolizations**
	Reading: 1.3
R 08/30	**Symbolizations**
	Reading: 1.3
T 09/03	**Introduction to derivations- rules of inference**
	Reading: 1.4
R 09/05	**Direct derivations**
	Reading: 1.5
T 09/10	**Conditional Derivations**
	Reading: 1.6
R 09/12	**Indirect derivations**
	Reading: 1.7
T 09/17	**Subderivations**
	Reading: 1.8
R 09/19	**Hint sheet**
	Reading: 1.10, "Hint sheet- version 1" posted to course website
T 09/24	**Review**
	Reading: Practice midterm posted to course website
R 09/26	**Midterm 1**
	Reading: None
T 10/02	**A language for propositional logic, symbolizations**
	Reading: 2.1, 2.3
R 10/04	**New rules of inference, derivations**
	Reading: 2.4, 2.5
T 10/09	**Derivations and derived rules of inference**
	Reading: 2.8

R 10/11	**More derivations, updated hints, truth tables** Reading: 2.10, "Hint sheet- version 2" posted to course website
T 10/16	**Truth value analysis, shortcut "reductio method"** Reading: "Reductio method" handout posted to course website
R 10/18	**HOLIDAY**
T 10/23	**Review** Reading: Practice midterm posted to course website
R 10/25	**Midterm 2** Reading: None
T 10/30	**A language for predicate logic, free and bound variables, symbolizations** Reading: 3.1-3.3
R 11/1	**Symbolizations** Reading: 3.5
T 11/6	**Symbolizations** Reading: 3.5
R 11/8	**New rules of inference, basic derivations** Reading: 3.6
T 11/13	**Universal derivations, quantifier negation rules** Reading: 3.7-3.8
R 11/15	**More derivations** Reading: None
T 11/20	**More derivations** Reading: None
R 11/22	**Showing invalidity- the method of models** Reading: 3.10
T 11/27	**HOLIDAY**
R 11/29	**Showing invalidity: the expansion method** Reading: "Expansion Method" handout on course website
T 12/4	**Review** Reading: Practice final posted to course website.
12/13, 8:00am	**FINAL EXAM**