# PHIL 201: INTRO TO LOGIC
## Rutgers Summer 2010
## M and W 6-9:40pm, Hickman Hall 211

**INSTRUCTOR:** Meghan Sullivan
**OFFICE HOURS:** TBD(and by appt), 3 Seminary Place RM 215A
**CONTACT:** Sullivan.meghan@gmail.com (preferred)

## COURSE GOALS:

This course introduces students to two very useful logical systems: standard propositional logic and standard predicate logic. We will study the grammar, proof theory, and semantics for these languages. Students will learn (1) how to translate arguments from English into these languages, (2) how to construct rigorous proofs of theorems, and (3) how to find models and countermodels for formulas in these systems. Time permitting, students will also learn some rudimentary set theory and metalogical concepts like soundness and completeness. This is a first course in symbolic logic and presupposes no previous background in philosophy or mathematics. It is suitable for any undergraduate interested in the basics of formal logic and fulfills a requirement for the Philosophy major.

## REQUIREMENTS:

Our study of logic will be cumulative—each lesson will, for the most part, build on results learned previously. Logic is challenging but immensely rewarding. **Because this class meets only once a week, the pace will be very demanding.** To succeed you must consistently attend lecture, work through the homework and practice problems, and ask questions whenever you fall behind.

10% QUIZZES- I will often start the class with a pop quiz. The quiz will usually (but not always) be one question from the most recent homework problem set or assigned reading. You will have 5 minutes to solve the problem, without using notes or your textbook. Pop quizzes will receive 2pts for a perfect answer, 1pt for an attempt, and 0pts if you are not present to take the quiz. Your top five quiz grades will constitute 10% of your final grade.

20% HOMEWORK PROBLEM SETS- There will be ten homework problem sets for this course (one nearly every non-exam week). Problem sets will be posted online after lecture on Wednesday and must be completed and submitted electronically by Monday at 10pm. You may attend my office hours to ask questions about the problem sets. You may discuss the general structure of the problems with other students. And you may check your problems as often as you like using the software. But the work you submit **MUST BE YOUR OWN WORK**. The software can detect copied homework, and so can I. Copying homework will be considered a violation of the academic integrity policy in this course.

30% MIDTERM- There will be a closed-book, in-class, midterm exam halfway through the course. You will have half the course period to take the midterm.

40% FINAL- There will be a closed-book, in-class, cumulative final exam at the end of the course. A study guide will be released one to two weeks before the end of the course.

## GRADING:

The midterm and final are graded on a 100-point scale. For the final course grade, I will use the following breakdown:

A= 100%-90%
B+= 89%-86%
B= 85%-80%
C+=79%-75%
C= 74%-70%
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 Biggest Prover... See the webpage for further information: http://sites.google.com/site/thebiggestprover/

## CLASS ETIQUETTE AND 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 expulsion 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.

## TEXTBOOKS:

There is one required book for this course:

Language, Proof, and Logic. (Barwise and Etchemendy).

I have ordered it at the bookstore. **YOU MUST PURCHASE A NEW COPY OF THE BOOK TO USE THE HOMEWORK SUBMISSION SOFTWARE.** It is best if you purchase it very quickly, since we'll be using it for nearly all of the course sessions. Any other readings will be on the Sakai course website linked to your Rutgers account. The tab is called Phil 201 (Sullivan). Problem sets and study guides will also be posted on the Sakai site.

### TENTATIVE SCHEDULE:

Regular classes will begin with the quiz. There will be a ten-minute break sometime in the middle of class. See up-to-date syllabus on Sakai for updated assignments.

### Intro, Basics of Atomic Sentences, Validity and Soundness

Suggested Reading: Ch 1 (all), Ch 2 (just section 1).
        *[Assigned reading should always be completed BEFORE class].*
HW: Prob Set 1 (Sakai)

### Negation, Conjunction, Disjunction… What's Your (Truth) Function?

Required Reading: Ch 3 (all), Ch 4 (all)
HW: Prob Set 2 (Sakai)

### Logical Consequence and Fitch Proofs

Required Reading: Ch 2 (all), Ch 6 (all)
HW: Prob Set 3 (Sakai)

### Crazy for Conditionals (and Biconditionals)!

Required Reading: Ch 7 (all), Ch 8 (all)
HW: Prob Set 4 (Sakai)

### Wrapping up Conditionals and Midterm Review

HW: Study for the Midterm

### MIDTERM, The Sordid History of Predicate Logic

HW: The Frege Memorial Problem

### Intro to Quantifiers and Translation

Required Reading: Ch 9 (all)
HW: Problem Set 6

### More on Translations

Required Reading: Ch 11 (all)

HW: Problem Set 7

**I Can't Get No (Objectual) Satisfaction: Semantics for Quantifiers**

Required Reading: Reread Section 9.4, Ch 10 (all)
HW: Problem Set 8

**Rules of Inference for Quantifiers**

Required Reading: Ch 12 (all) and 13 (all)
HW: Problem Set 9

**Numerical Quantification and More Proofs**

Required Reading: Ch 14
HW: Problem Set 10

**Basics of Set and Model Theory/Metalogic**

Required Reading: Ch 15
HW: Review Packet for Final

**Final Exam Review**

END OF BIGGEST PROVER!