Introduction to Logic

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Introduction: This is an introductory class in symbolic logic. Logic is the study of how to reason correctly. *Symbolic* logic approaches this using "formal languages". Our first formal language will be propositional logic; we will then go on to predicate logic (with identity). In each case, we will learn to translate between English and logic, to construct derivations of valid arguments, and to establish the invalidity of invalid arguments.

Readings: There is one required textbook: *Symbolic Logic: A First Course*, second edition, by Gary Hardegree, which is available on his web site:

http://people.umass.edu/gmhwww/110/text.htm

We will cover the whole book. In addition, there are three required handouts available for download on this course's web site, on which homework assignments, solutions, and announcements will also be posted:

http://fas-philosophy.rutgers.edu/sider/teaching/201/201.htm

Grades: Your grade will be 80% based on 3 exams and 20% on 7 homework assignments. Dates and times of exams and homeworks will be announced in class. The last exam will be at our scheduled time during finals week, but will not be cumulative. You must take the exams at the scheduled times; the course is too large to allow any exceptions except in the most extreme of circumstances (e.g., nuclear war). I will drop your lowest homework score and calculate your homework grade using the remaining scores. The due dates of the homework assignments will be announced in class and posted on the web site. Homework will be graded on a scale from 0-10. In some cases, I (or my grader) may not grade each of the problems on your homework assignments, so you should check your work against the solutions, which will be posted on the web site. **Note**: missed homework assignments can have a very big impact on your course grade.

Advice: Class attendance is recommended. Logic, like mathematics, is cumulative, so you will be in trouble if you get behind early in the class. The book contains many helpful exercises at the back of each chapter, as well as solutions. In addition to the assigned homework, I strongly recommend that you do these exercises. In order to be properly prepared for the exams, you should do exercises until you can solve the more difficult ones quickly, and without looking at the solutions. Doing problems is an integral part of succeeding in logic. As with a mathematics class, it isn't enough to attend class and understand what is said there. You need to practice doing problems.

Outline

1. Introductory remarks on logic

   Reading: skim chapter 1

2. Propositional logic: truth tables

   Reading: chapters 2-3

   Homework assignment 1

3. Propositional logic: translations

   Reading: chapter 4

   Homework assignment 2

4. Propositional logic: derivations

   Reading: chapter 5 (just skim over sections 1-5, but read the rest carefully)

   Homework assignment 3

   Exam 1

5. Predicate logic: symbolizations

   Reading: chapters 6-7; plus web handout "translations using the identity sign"

   Homework assignments 4 and 5

   Exam 2

6. Predicate logic: derivations

   Reading: chapter 8; plus web handout "derivations using the identity sign"

   Homework assignment 6

7. Invalidity in predicate logic

   Reading: web handout "invalidity in predicate logic"

   Homework assignment 7

   Exam 3