**Philosophy 008: Introduction to Logic**

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Lecture: M/W 9:00-10:20 UV Theater 10

This course is an introduction to logic, presupposing no prior knowledge of the subject. We begin with basic notions of argument, validity, inference, and proof. We then learn how to symbolize arguments in natural languages like English by translating them into a formal language, the language of Propositional Logic. Propositional Logic is the logic of truth functions, sometimes called *Boolean functions* after their study by the 19th century mathematician and logician George Boole, which serves as the basis of other logics. The core of the course is learning Propositional Logic. Propositional Logic (like any logic) is composed of three components: The syntax, which determines the grammar of the language of Propositional Logic; the semantics, which determines what the sentences of the language *mean*; and the proof theory, which determines what sentences can be derived from what sentences. To learn the semantics of the language of Propositional Logic, we will primarily be learning to construct and use Truth Tables to establish a number of logical properties that sentences and sets of sentences have. The bulk of the class consists of learning to use a proof theory of Proposition Logic, where we learn to construct derivations that prove the validity of certain inferences.

Logic is a field of study on its own and Propositional Logic is the entry ticket into that field. Logic, and especially Propositional Logic and truth functions, also central to computer science and almost any programming language, as well as linguistics and mathematics, among other disciplines. But the material covered in this course has broader application, as it is key to problem solving in general and being a good critical reasoner. One place where this application is most apparent is with the logical reasoning and logic game questions on the LSAT exam required for entry into most law schools. (So, anyone thinking of applying to law school will well served taking this course, as their LSAT score will almost certainly be improved.) We will spend a week in the fifth week applying the material learned in the first four weeks to LSAT logic game problems.

COURSE REQUIREMENTS AND POLICIES: Weekly problem sets, 10 sets in total (all 10 sets worth 15%); quizzes (worth 5%); two midterm exams (first worth 15%, second worth 25%); final exam (worth 35); TA discretion (≈5%). A passing grade in the course requires a passing grade on total score for problem sets and on each of the three exams. The textbook is available on iLearn.

Weekly problem sets will typically be released by Sunday of each week and are due the following Saturday by 10pm (unless otherwise noted) and must be submitted online through the course webpage. Late submissions will not be counted. Even if you know your answer is incorrect, you should submit for partial credit.
The material takes time to digest, assimilate, and, above all, practice, so you cannot wait until right before the exams to try to cram; instead, stay on top of the material as it is being assigned and presented and practice doing the problems during the week leading up to the problem sets.
Plagiarism of any sort will not be tolerated. Although you may work on problem sets in groups, any work submitted as your own absolutely must be your own. (Working together DOES NOT mean splitting up the problems and copying another person's work. It means discussing the problems and techniques employed, guiding and helping one another, and learning from and teaching one another.) The problem sets are but a tool for learning how to do the problems. Merely doing the problem sets successfully will not earn you a passing grade for the course, so be sure you understand the problems yourself. Quizzes are designed to give you low-stakes feedback on the sort of questions that will be on

the exam. If you are having difficulty with the material, come and get help… early on. The material builds on itself, so if you are struggling, come and talk early in the term, when it will be easier to get things straightened out. If you are encountering problems with any aspect of the course, problems accessing the course material, problems with your sections or with lectures, or difficulties with the material and problem sets, please contact me over email or visit me during my office hours so that we can get things sorted out, and of course meet with your TA.

**Tentative Schedule**

**Week 1**: M 30 Sept/ W 2 Oct
Topic: Arguments and Validity & Symbolism and Translation
Reading: Chpt 1, pp. 4-14; chpt 2, pp. 15-44
problem set 1 due Monday 7 Oct 10pm***note nonstandard date

**Week 2:** M 7/ W 9 Oct
Topic: More Translation & Truth Tables: How to Build Them
Reading: Chpt 3.0-3.3, pp. 49-65
problem set 2 due Saturday 12 Oct 10pm

**Week 3**: M 14/W 16 Oct
Topic: Building Truth Tables & Logical Status and Consistency
reading: Chpt 3.4-3.5, pp. 65-71
problem set 3 due Saturday 19 Oct 10pm

**Week 4**: M 21/W 23Oct
Topic: Truth Tables: Logical consequence, and equivalence
Reading: Chpt 3.6-3.8, pp. 71-84
problem set 4 due Friday 25 Oct 10pm***note nonstandard date
Wednesday 23 Oct In-class **FIRST MIDTERM EXAM**

**Week 5**: M 28/W 30 Oct
Topic: LSAT: Logical Reasoning and Logic Games
no reading
problem set 5 due Saturday 42 Nov 10pm

**Week 6**: M 4/W 6 Nov
Topic: Semantic Proofs
reading: Chpt 3.9, pp. 84-88
problem set 6 due Saturday 9 Nov 10pm

**Week 7**: ~~M 11~~ [Veterans day]/W 13 Nov
Topic: Proof Theory--Derivation Basics & Six Simple Rules
reading: Chpt 4.0-4.1, pp. 91-102
problem set 7 due Saturday 16 Nov 10pm

**Week 8**: M 18/W 20 Nov
Topic: Proof Theory—Subproofs, Conditionals
reading: Chpt 4.2, pp. 102-111
problem set 8 due Friday 22 Nov10pm***note nonstandard date
Monday 25 Nov In-class **SECOND MIDTERM EXAM**

**Week 9**: W 27 Nov
Topic: Proof Theory: Subproofs: Negation elimination
reading: Chpt 4.3, pp. 111-118
problem set 9 due Monday 2 Dec 10pm***note nonstandard date

**Week 10**: M 2/W 4 Dec
Topic: Proof Theory: Disjunction elimination
reading: Chpt 4.4-4.5, pp. 119-137 [4.5 is highly recommended but optional]
problem set 10 due Friday 6 Dec 10pm***note nonstandard date

FINAL EXAM: Thursday, 12 Dec, 8:00 a.m. - 11:00 a.m.