

Phil 1304: Introduction to Logic

Fall 2016, University of Texas, El Paso
Class Meets: TR 9:00—10:20 a.m., Education 313

Contact Information

Professor: Marc A. Moffett
Phone: 915.747.5804
Email: mamoffett@utep.edu

Office: Worrell 202
Office Hrs: T 11:15-12:15, R: 2-3 and by
appointment.

Text:

Barker-Plummer, Barwise, Etchemendy. 2011. *Language, Proof and Logic* (2nd ed.). Stanford, CA: CSLI.

PLEASE NOTE: You **must** have an unused CD in order to submit homework problems. Beware of purchasing used copies online.

Also for help and support see the website, <http://ggweb.stanford.edu/lpl/>

Paperless version of the text and a downloadable version of the software is available for purchase at the above website.

Description:

Logic is the theory of *correct* reasoning. It is, therefore, a normative theory: it does not aim to describe how people actually do reason, but rather how they ought to reason.

For most people, the medium in which they reason is some natural, informal language such as English. Symbolic logic aims to regiment this informal reasoning by means of an artificial, precisely specified language. The idea is that natural languages have historically developed not solely (or even primarily) for purposes of reasoning, but for the sake of more general communicative goals (e.g., ease of expression). By contrast, the formal logician aims to develop a language which “strips away” these logically extraneous features so that she can focus more carefully on only the logically relevant features of the language.

It is important to realize, however, that this is more easily said than done. What features of a language are logically extraneous? What features are important, even essential? There are no simple, uncontroversial answers to these questions. Nevertheless, it is possible to make some progress by reigning in our ambitions somewhat. Rather than trying to capture all of the logically relevant features of a language at one go, we can instead carve off increasingly more complex fragments of a language and try to understand their logical characteristics. The result will be a series of increasingly sophisticated and powerful logical systems (logics) which capture increasingly larger aspects of natural languages. This is an on-going process. Logic, far from being a settled system of principles of correct reasoning, is a philosophically rich and productive area of research.

In this course, we will focus primarily on what is known as classical logic. Specifically, we will develop two logical systems in detail: sentential logic and quantificational logic. These logical systems are extremely well-understood and form the backbone for understanding more advanced issues in philosophy, mathematics, linguistics, and computer science. Time permitting; we will also look at more advanced issues concerning modal logic and the logic of counterfactuals.

Goals:

- To achieve a detailed understanding of classic first-order predicate logic.
- To understand some of the *philosophical* framework surrounding logic.

Evaluation:

Homework [50% of total grade]

Two In-class Exams [25% of total grade each]

Course Schedule:

Week	Topic	Readings
T 8/23	Introduction	Intro. pp. 1-11
	PROPOSITIONAL LOGIC	
R 8/25	Atomic Sentences <ul style="list-style-type: none">• Homework due 8/30	Ch. 1.1-1.4
T 8/30	Validity, Soundness, and Proof <ul style="list-style-type: none">• Homework due 9/06	Ch. 2.1-2.6
R 9/01	Boolean Connectives: \neg , \wedge , \vee <ul style="list-style-type: none">• Homework due 9/13	Ch. 3.1-3.7
T 9/06	Boolean Connectives Cont'd	
R 9/08	Catch up/Review	
T 9/13	The Logic of the Boolean Connectives <ul style="list-style-type: none">• Homework due 9/22	Ch. 4.1-4.4
R 9/15	Logic of Boolean Connectives Cont'd	
T 9/20	Methods of Proof <ul style="list-style-type: none">• Homework due	Ch. 5.1-5.4
R 9/22	Methods of Proof Cont'd	
T 9/27	Formal Proofs <ul style="list-style-type: none">• Homework due 10/06	Ch. 6.1-6.4
R 9/29	Formal Proofs Cont'd	Ch. 6.3-6.4
T 10/04	More on Proofs <ul style="list-style-type: none">• Homework due 10/11	Ch. 6.5-6.6
R 10/06	More on Proofs Cont'd	
T 10/11	Catch up/Review	
R 10/13	Midterm Exam	
T 10/18	Conditionals <ul style="list-style-type: none">• Homework due 10/25	Ch. 7.1-7.3

R 10/20	Conditionals Cont'd	
T 10/25	The Logic of Conditionals	Ch. 8.1-8.2, 8.4
	• Homework due 11/01	
R 10/27	The Logic of Conditionals Cont'd	
T 11/01	Introduction to Quantification Theory	Ch. 9.1-9.6
	• Homework due 11/08	
R 11/03	Introduction to Quantification Cont'd	
T 11/08	Logic of Quantifiers	Ch. 10.1-10.4
	• Homework due 11/15	
R 11/10	Multiple Quantifiers	Ch. 11.1-11.5
	• Homework due 11/15	
T 11/15	Catch up/Review	Ch. 12.1-12.4
R 11/17	Methods of Proof	
	•	
T 11/22	Methods of Proof Cont'd	
R 11/24	THANKSGIVING BREAK	
T 11/29	Formal Proofs	Ch. 13.1-13.3
	• Homework due 12/01	
R 12/01	Review	
T 12/06	FINAL EXAM	
