

**Basic Logic**  
**Philosophy 2020 (001)**  
The University of Western Ontario

**Class Days and Hours:** Tuesday – Thursday, 11:30 – 12:30, UCC-67

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**COURSE DESCRIPTION:**

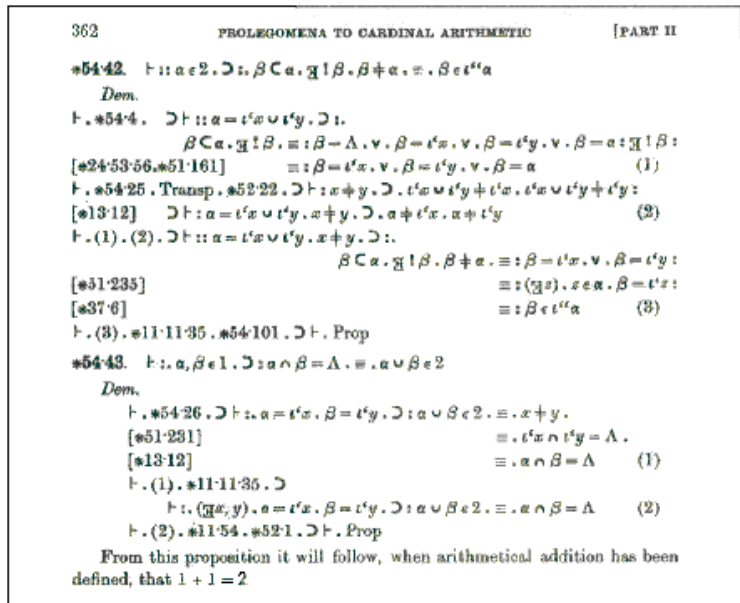


Fig. 1. From the *Principia Mathematica*: Russell and Whitehead finally prove that ‘1 + 1 = 2’ is, indeed, logical.

Why study logic? It is the secret language of machines. The semiconductors of every logic gate, in every circuit, in every device speak this stilted, bizarre, and sometimes even beautiful tongue. Formal logic is omnipresent, everywhere but invisible in ubiquity, whispering inside plastic enclosures and behind LCD screens, providing the necessary structure for every programming language and software application. To understand logic is to understand the information age.

The utility of logic is not limited to the digital realm: logic began as a series of self-aware questions centrally connected with inference and truth. This was no small revolution in thought, to ask ‘what can we legitimately infer from a set of premises?’ ‘What follows from some given set of facts?’ ‘When is an argument *valid*?’ It has the potential to destabilize established orthodoxy: for every argument assumes that the conclusion bears some logical relation to the premises presented. What if it turned out that what we believed just *doesn’t* follow? Beyond the daunting formalisms and the thick forest of symbols lies the central and compelling motivation that led figures separated by millennia—Aristotle, Ockham, Frege, Gödel—to ask: *what is it to reason well?*

We can only begin to summarize the results of over two thousand years of logical investigations. We will do so by introducing two systems of logic: classical sentential and first-order predicate logic. While the main focus of the course will be the mastery of these two systems, along the way there will be opportunities to discuss the philosophical significance and practical applications of logic.

## **COURSE OBJECTIVES**

This course has two objectives. The first is to help students master two distinct, but related systems of formal logic. While the systems themselves may not prove to be particularly useful outside the classroom, the formal exercise develops abstract thinking, problem-solving, and clear analysis. The second goal is to distill the lessons of formal logic into a set of practical tools that will enable students to (a) quickly understand and evaluate formal arguments and (b) understand the relation between logic and related issues in computer science and linguistics.

## **REQUIRED TEXTS:**

Bergmann, Moor, & Nelson. *The Logic Book*, 5<sup>th</sup> Ed.  
Available at the bookstore.

*Note:* Used copies of the 4<sup>th</sup> Edition are also acceptable, though pagination will be slightly different.

## **REQUIREMENTS:**

Assignments: 40% (4 per semester; worth 5% each).  
Mid-Year: 30% (December exam period)  
Final: 30% (April exam period).

## **CLASS SCHEDULE:**

Fall: Chapters 1-6.  
Winter: Chapters 7-10.

*More details forthcoming.*



Fig. 2. This course will not make you Spock. (Google the term 'straw Vulcan.')