



# Logic: Principles of Reasoning

Mondays-Fridays, 9AM - 3PM

JHU's Center for Talented Youth

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**Course Description:** This course is designed to introduce students to the basic principles of philosophical and logical reasoning. The course is composed of two parts. The first part of the course (which will occur in the mornings) is devoted to logic. Students will master the basic elements of propositional logic by learning basic syntax and symbolization, basic semantics (truth tables and truth trees), and a basic derivation system. The second part of the course (which will occur in the afternoons) is devoted to exploring deep philosophical questions, utilizing the tools learned from the logic part of the course. We explore a number of questions in ethics, metaphysics, epistemology, and philosophy of religion, mind, and science.

**Prerequisites:** None.

**Required Text:** *The Logic Book*, 6<sup>th</sup> Edition

**Authors:** Merrie Bergmann, James Moor, and Jack Nelson

**ISBN-13:** 978-0078038419

## Course Objectives:

By the completion of this course, students will:

1. learn how to symbolize English sentences in the language of propositional logic.
2. know how to use truth tables and truth trees to determine a number of logical properties a sentence or argument might have.
3. be able to construct derivations in a proof system for propositional logic.
4. learn how to succinctly argue for a position and defend the relevant premises.
5. learn how to critically discuss one another's arguments in a friendly and charitable way.
6. strengthen their writing skills by learning how to write argumentatively.

## Tentative Course Outline:

The morning sessions will be devoted to covering about half of our textbook. Each morning, after learning the material for that day, you will work through a number of problems from the book (sometimes on your own and sometimes in small groups). The afternoon session will be devoted to exploring a number of philosophical questions. Below is a tentative schedule for what we will cover:

Day	Content
Day 1	<ul style="list-style-type: none"> <li>• Pre-test</li> <li>• Syntax and symbolization of SL</li> <li>• Question: Do we have souls?</li> </ul>
Day 2	<ul style="list-style-type: none"> <li>• Symbolization practice</li> <li>• Truth tables</li> <li>• Question: Is everything physical?</li> </ul>
Day 3	<ul style="list-style-type: none"> <li>• Truth-functional truth, falsity, indeterminacy, equivalence, and consistency</li> <li>• Question: Are we dreaming?</li> </ul>
Day 4	<ul style="list-style-type: none"> <li>• Truth-functional entailment and validity</li> <li>• Question: What is it to know something?</li> </ul>
Day 5	<ul style="list-style-type: none"> <li>• Midterm review session</li> <li>• Midterm</li> <li>• Movie: The Truman Show</li> </ul>
Day 6	<ul style="list-style-type: none"> <li>• Truth trees</li> <li>• Question: Does God exist?</li> </ul>
Day 7	<ul style="list-style-type: none"> <li>• Truth tree rules</li> <li>• Question: Can God eliminate evil?</li> </ul>
Day 8	<ul style="list-style-type: none"> <li>• Truth trees and truth, falsity, indeterminacy, equivalence, and consistency</li> <li>• Question: What makes a wrong action wrong?</li> </ul>
Day 9	<ul style="list-style-type: none"> <li>• Truth trees, entailment and validity</li> <li>• Question: Why is it wrong to kill someone?</li> </ul>
Day 10	<ul style="list-style-type: none"> <li>• Midterm review session</li> <li>• Midterm</li> <li>• Movie: The Fellowship of the Ring</li> </ul>
Day 11	<ul style="list-style-type: none"> <li>• The derivation system SD</li> <li>• Question: Does Louis Lane believe that Clark Kent can fly?</li> </ul>
Day 12	<ul style="list-style-type: none"> <li>• Basic concepts of SD</li> <li>• Question: Do we have free will?</li> </ul>
Day 13	<ul style="list-style-type: none"> <li>• Strategies for constructing derivations in SD</li> <li>• The derivation system SD+</li> <li>• Question: Could the whole universe be shifted 5 feet to the left?</li> </ul>
Day 14	<ul style="list-style-type: none"> <li>• Midterm review session</li> <li>• Midterm</li> <li>• Question: Is time-travel possible?</li> </ul>
Day 15	<ul style="list-style-type: none"> <li>• Post-test</li> <li>• Movie: Sherlock</li> </ul>